

THE MEDICAL NEWS.

A WEEKLY JOURNAL OF MEDICAL SCIENCE.

VOL. 80.

NEW YORK, SATURDAY, APRIL 19, 1902.

NO. 16.

SPECIAL ARTICLE.

COMPULSORY VACCINATION ESSENTIAL. THE EXAMPLE OF PORTO RICO.

BY AZEL AMES, M.D.,

OF PORTO RICO;

LATE MAJOR AND BRIGADE SURGEON, U. S. V., COMMANDING U. S. VACCINE CORPS AND DIRECTOR OF VACCINATION DEPARTMENT
OF PORTO RICO.

THE prevalence of smallpox during the last few months over the entire territory of the United States (except parts of its newly-acquired insular demesne) and its considerable coeval increase in Great Britain are highly significant and challenge especial attention, both as to the causes of these outbreaks and the means for their suppression. Both of these subjects present new and highly interesting features, and no study of the care and control of the disease can be either complete or effective which fails to take note of certain influences which have been potential for the first time, either absolutely or in degree, in spreading it rapidly and widely over both countries.

Among the new notable features of the epidemic in the United States (for such it soon became) are the exceptional rapidity of its march; the resulting coincidence of the disease in all parts of the country, unparalleled in previous experience; the increased percentage of infant mortality over that of recent years; the practical exemption from the disease of certain parts of our new insular domain, especially those nearest us; and the new agents and practices which have become elements of vaccination, long recognized the world over as the sovereign power in the prevention, control and modification of variola. The first three of these are equally noticeable in the outbreak in Great Britain, the third especially, though the first two would be, of course, of comparatively little significance, owing to her very small area, if it were not that her superior system of sanitary control has hitherto enabled her to keep well in hand the spread of this disease.

To call attention to the new and grave causes which have been largely responsible for the occurrence, to the quick march and the general spread of the present epidemic, and to its large infant mortality; to point out the steadily increasing power for harm of these causes, the imperative necessity for quickly removing such as we can, and of setting up every possible safeguard against the rest, are the purposes of this article.

A hasty consideration of the chief causes of this outbreak and their operation, as directly connected with the measures to be applied to its repression, prompts the following suggestions.

a. Epidemic cycles of the disease in any country, since the introduction of inoculation, and especially of systematic vaccination, doubtless sustain a more or less definite relation to the susceptibility of each generation, or, in other words, to the material for the disease to feed upon existing in it. In proportion as the unprotected, the non-immune element, whether that which has outworn its vaccine protection, or that which has never yet had any, increases in volume and is exposed to sources of contagion, or the reverse, the cycle intervals seem to shorten or lengthen. Until lately their almost uniform tendency has been to lengthen, but at present, owing to new and potent influences hereafter considered, this is reversed and these influences, so far

as they have had scope, have beyond doubt borne a principal part in bringing about the present alarming outbreaks in both countries, especially in England. A much lessened protection and greatly increased opportunities of exposure to contagion are evidently, then, the determining influences, under which all lesser ones group themselves, of the present prevalence of variola at home and abroad.

Of the first of these, a lessened protection, there has been in Great Britain for the past four years a sad and powerful illustration and experience, the influence of which has already reached these shores, and the examples and effects of which have been most pernicious everywhere and are cumulative. After enjoying for more than a century the high honor of having given to the world, through the immortal Jenner, the untellable benefits of vaccination, having been able always to boast the best health administration, and being the benevolent pattern in sanitary legislation and conduct to all other people under the sun, Great Britain four years since enacted a modification of her "compulsory vaccination law," introducing what is known as the "conscience clause," whereby any person claiming conscientious convictions as to the baleful effects of vaccination is exempted therefrom. It is safe to say that no such step backward in its relation to the physical well-being of mankind has ever been taken by any enlightened nation and already its malefactors are seriously and painfully apparent. For the originators and givers of this great boon to mankind thus to discredit its value and throw doubt upon its beneficence was a blow to humanity and an encouragement to the ignorant, prejudiced and irresponsible, the cost of which can never be computed, but has already reached fearful figures. The larger percentage of infant mortality from variola and the very large falling off in revaccination already recorded in England are due, beyond a doubt, almost wholly to this relaxation of protective measures. The increased doubt and distrust naturally created in this country by the action of the British Parliament has unquestionably been responsible for the neglect of thousands to seek the protection of vaccination and revaccination for themselves and their children, from which neglect have already certainly sprung disease, distress and death.

b. The unfamiliarity of the present generation of physicians with the disease clinically. The fact is that, in this country at least, by far the larger number of physicians have never seen a case of smallpox or varioloid, from which unfamiliarity numerous errors of diagnosis and consequent exposure of many to the disease have occurred.

c. The fancied security and the consequent relaxed vigilance and loosely-enforced protective regulations, both of sanitary and school authorities, induced by long periods of immunity from the disease, especially as related to the inspection of tenements, etc., and the systematic vaccination of school-children and operatives.

d. The growth, with the diffusion of general intelligence and means, of a more self-assertive and mistakenly aggressive individuality, which, until more fully informed, often resents and resists the idea of any legal control of, or interference with, one's personal liberty, and, lacking full knowledge, is credulous of all bugbears and distrustful of all vaccination, lymph, and other sanitary means and measures to suppress the disease. It

is this half-informed, but very active opposition which has made possible in England the practical overthrow of compulsory vaccination and which has led to the wide neglect of and opposition to vaccination existing with us and seriously threatening our own protective legislation.

Among the more important of the second group of prime causes of the epidemic mentioned, the greatly increased opportunities of exposure to the disease,* must be counted:

a. The recent unexampled periods of industrial activity in which the great textile factories and other "beehives of industry" have been unwontedly full, and in which single sparks of contagion readily light the rapid and wide-spreading fires of an epidemic.

b. The unprecedentedly great and constantly increasing facilities of street-railway, railroad, and other communication in cities and towns, and between industrial and commercial centers; and the recent and growing habit of operatives of all classes of frequently shifting back and forth between these centers. This, indeed, is but a small fraction of the mighty ebb and flow of travel between all sections, or of that between this and other countries, never so great as of late, all affording every opportunity for the transmission of disease.

c. The increased use in all populous communities of public conveniences and of general dependence on the part of all upon common sources of domestic utility, such as laundries, barbers, baths, lavatories, bakeshops, and upon milkmen and other vendors, constantly passing from house to house.

d. The enormous growth and gatherings of public assemblies at churches, theaters, etc., and especially of the public schools, which in spite of some precautions used are in many communities perhaps the most active and effective disseminators of disease.

Setting aside the probable cycle tendency of each generation mentioned and the presumable effects of congenial atmosphere and kindred conditions as admitted factors in every considerable recurrence of variola, the other influences briefly mentioned, new in themselves or in their proportions, must be held largely accountable for the invasion, the celerity of movement and the wide and unprecedented coexistence of the present epidemic. That they are just such influences as must inevitably precipitate such results is certain; that they have done so is matter of competent testimony, observation and comparison.

The recent notable increase of infant mortality from variola in Great Britain was to be expected as the most immediate and logical sequence of the overthrow of compulsory vaccination and must be regarded as but the forerunner of a like increase among the adult population, if the "conscience clause" of the British "Vaccination Act" be not speedily repealed. This increase is likely to be manifest as soon as the vaccine protection now existing in the passing generation ceases and the lack of it (from refusal "under the conscience clause" to be vaccinated or revaccinated) in this and succeeding generations shall permit.

The practical exemption of Cuba and Porto Rico, especially the latter, from this epidemic of variola is strikingly interesting and significant. Both these islands have always been under Spanish rule, notoriously deficient in sanitary regulations, hot-beds of variola in which the mortality, as might be expected where only the most spasmodic and ephemeral regard for vaccination existed, has constantly been very high. They are both in closer touch with our shores than ever before.

*The vaccination by the steamship companies *en voyage* or on arrival is most perfunctory and valueless, 600 or more often being "run through" in a few hours, recklessly by one or two physicians.

With smallpox always more or less active, the average death-rate in Porto Rico, for the ten years prior to the American occupation, as ascertained from Spanish vital statistics, was 621 per annum and the constant presence of the disease and its high mortality had apparently come to be accepted as inevitable. To-day the annual death-rate does not exceed 2, in a population of 960,000; the disease is practically non-existent on the island and has been since the general compulsory vaccination of 1899.

While, as indicated, the discreditable overthrow of compulsory vaccination in Great Britain has negatively attested, on the one hand, by the disastrous results which have followed, the value and necessity of its protection, the United States has, on the other, to its high honor among the nations, furnished in its "new possessions" the positive proof of the absolute power of well-conducted vaccination to control and eradicate smallpox. Never was antidote more opportune to overcome the bane; never counter-stroke to a blow more effective than the compulsory vaccination of Porto Rico and its grand results, as answer and more than offset to the blunder of the British Parliament. Hardly had the last of the representatives of Spanish misrule turned their backs upon the island before the American military administration, though wholly new to the science and are of colonial government, set on foot, as an act of beneficence to the newly subordinated people, the vaccination of the entire population, and the production in the island itself of the requisite bovine virus.

Porto Rico in Evidence.—The American army under General Miles landed in Porto Rico in July, 1898, and gradually occupied the island, working eastward, westward, and northward from Guanica, Ponce, and Arroyo on the south coast, until it was in full possession. The last of the Spanish army and its adherents left the island in October, 1898, and General John R. Brooke was established as American Military Governor at San Juan, the capital. A considerable naval squadron, a much larger fleet of army transports, quartermasters' vessels, etc., a Spanish army of some 11,000 fighting men and attaches and the American army of 8,000 men and adherents had meantime doubtless contributed each its quota to the grand total of cases of variola, always more or less prevalent among the population during the Spanish régime. In some of the principal places, such as Ponce and San Juan, the local health authorities had kept up a desultory, but altogether ineffectual oversight and partial isolation of the disease, with a feeble effort at vaccination, apparently not so much with the idea of attempting to eradicate the disease, as to keep it somewhat in check, yet sufficient to furnish business to the local medical practitioners and excuse for the existence of the health officer and his salary.

Under the more or less efficient supervision soon established by the United States military authority, this local oversight and control were sufficient to accomplish, for a time, a considerable degree of repression of the disease in the chief places. Practically unchecked, however, in the outlying villages and the hill-country and aided by the peregrinations of the unsettled inhabitants and troops, it steadily took on greater proportions, no part of the island being free from it, until nearly all the country barrios (precincts) were infested and its reflex tide began to work back into the larger towns and cities. For the first time in the cognizance of American sanitary officers, the spectacle was presented of the non-populous regions feeding the disease to the cities and towns, a condition of things which it will readily be seen greatly increased the difficulty of control. Where, as in the United States, the usual primary centers of the contagion are a few large cities or manufacturing towns, the task of restricting it is obviously much

easier and its spread is much less rapid than when a score or two of small and scattered communities, without sanitary regulations, are sending it daily to the market-towns and cities about them. It was therefore not only a fast-spreading and, indeed, general diffusion of variola throughout the rural population of Porto Rico, with but little less activity in the cities and towns, embracing altogether nearly a million souls, that confronted the American military authorities at the opening of the year 1899; but the conditions favoring its spread and hampering the only measures which could be effective in controlling it were quite exceptional, some of them creating difficulties seemingly almost insurmountable. Among the factors especially favoring the spread of the disease were (1) the tremendous headway it had already attained and the numerous centers of contagion existing; (2) the comparative indifference to it on the part of the mass of the native population, so long habituated to it that it was apparently regarded as inevitable and irremediable; (3) the absence of systematic sanitary authority, oversight or regulation, and hence the maximum of difficulty in ascertaining the whereabouts of cases; (4) the antipathy of the natives to removal from their own homes to hospitals or camps, for isolation and treatment, leading to habitual concealment of cases both in country and town; (5) the unusual facility afforded the spread of the disease by the density of the population, its overcrowded habitations and its "hand-to-mouth" habits of living compelling constant passing to and fro between country and town with or for supplies; (6) the very congenial climatic conditions, and (7) the uncleanly character of the habitations and their surroundings, of the air, water and food commonly used, and of the habits of the people.

Among the conditions exceptionally hampering the only known measures of restriction and control, were (1) the great difficulty of furnishing isolated care and treatment in pest-houses and camps for the hundreds of cases simultaneously occurring, owing to the great and inaccessible area over which they were spread, the inadequacy of transportation, there being often no roads, and the paucity of help; (2) the absolute impossibility of isolating the stricken in their crowded and thickly-set homes; (3) the very small number (proportionately) of physicians and medical apprentices to the population; (4) the very great difficulties of travel in the hill-country and hence the inaccessibility of a large part of the people, either for treatment or for vaccination; (5) the seeming impossibility of procuring any considerable supply of proper vaccine virus, on account of the distance of the ports of the United States, from which alone it could be brought in any quantity, and the attendant cost; (6) the difficulty of preserving the virility of the virus in its passage to the Tropics and after its arrival, it being found that very little virus sent from "the States," especially the glycerinated, retained its efficacy when received; (7) the great difficulty, even with plenty of virus, of vaccinating these hundreds of thousands of unregistered people, mostly ignorant and scattered, speaking foreign tongues, and unused to sanitary control.

The only conditions exceptionally favorable to the suppression of the disease were (a) the fact that as the population was insular the spread of the variola was limited by the sea-boundaries; (b) there were ample authority (civil and military), men, means, and material to work with; (c) the supply of young cattle for the production of virus was large, easily gathered and of excellent quality; and (d) a large percentage of the adult population had already had the disease, lessening the number requiring vaccination and the amount of fuel for variola. Private enterprise had, under the stimulus of Spanish municipal contracts, kept feebly

alive two very small farms for the production of bovine lymph, but both were nearly moribund at the American invasion, and no reliance whatever could be placed on either the amount or the character of their "out-put." Every effort at general vaccination made by the Spanish authorities had broken down, chiefly from lack of virus, purpose and vim.

The Proofs Positive.—The value of any statement lies in its import and its accuracy, as the importance of any achievement lies in its benefits to mankind. The requests from all parts of this country and abroad for information as to the inception, organization, conditions, conduct, and results of this exceptional campaign against smallpox have been many. Its importance as conclusive proof of the entire efficacy of vaccination in stamping out that disease, even under the worst and most difficult conditions, is self-evident and beyond computation. There have been—as is apt to be the case where great success is won against great odds—conflicting claims for the honors of the achievement. As is usually the case, too, these honors were divisible, different ones having different entitlements, and happily there were honors enough "to go round," despite some attempts to appropriate unfairly. It is to cover and establish, with some degree of exactness and authority, the several points and factors above mentioned that the following details of official action and the sequence of events as recorded are here so carefully stated.

Early in December, 1898, General Brooke was relieved; General Guy V. Henry, who was especially interested in sanitary matters, became Military Governor and a strong hand took the reins. In his report of June, 1899, Lieut.-Col. Hoff, then Chief Surgeon of the Department of Porto Rico, credits himself with announcing upon his arrival in October, 1898, "a desire to undertake the vaccination of the population of the island," although he states that the disease was then endemic only; elsewhere he fixes the date of the expression of his "intention," as privately made about November 15th of that year. Neither "desire" nor "intention," however, took formal shape, or bore fruit, and in a letter to the Adjutant-General of the Department, as late as November 23, 1899, the Chief Surgeon contents himself with recommending the thorough "vaccination of all the United States troops in the island." This, indeed, was all that army medical authority could properly consider, except as specially assigned to civil sanitary duty. In fact, Colonel Hoff was later twice reprimanded by the Surgeon General of the Army, though the latter was friendly to the undertaking, for using the men and material of the Army Medical Corps in the general vaccination ordered by General Henry as Insular Governor, because it was a civil affair. Col. Hoff also states in his (1899) report that, in a letter of December 19, 1898, to the Adjutant General of the Department, he recommended that "the necessary steps be taken to have the people of the island vaccinated," etc. Ten days later, General Henry "on his own motion," as he writes, evidently never having seen this recommendation of his chief army medical officer, but "because of the intelligence received from the *Alcaldes* of different parts of the island of the rapid increase of the disease," directed the promulgation of an order, by "Circular" of his chief civil officer, the Secretary of State, to the several *Alcaldes* (mayors), requiring them as civil officers to carry out universal vaccination. This purely civil order was reinforced January 3, 1899, by a military "General Order" (No. 1, Par. 2 c. a. of the General Commanding, though addressed expressly to the *Alcaldes* and boards of health. This "order" indicates how very difficult it sometimes was to keep distinct in thought, speech, and action the military and civil functions of the Military Governor,

in whom, for the first time in the history of the United States under such conditions, they were so peculiarly combined, each interest having independent existence and recognition, independent sources of revenue* and a full, independent official staff.

It is at this point therefore, though only to the extent of the promulgation of civic instructions through a military order, that there first appears an Army relation to the great vaccination work later borne principally on Army shoulders. Always in name, a civil undertaking; carried on under the direct local supervision and co-operation of the several *Alcaldes*; paid for chiefly out of Insular and municipal funds, though in part by the military chest, it was organized and directed wholly by medical officers of the Army and largely executed by them and the men of the Army Medical Corps. To the great credit of both military and civil officers it may be said that there was at no time any considerable friction between them in the discharge of their duties.

On January 7, 1899, as the apparent result of a conversation with the writer, the Chief Surgeon sent the following communication to the Surgeon General of the Army: "In order to make effective the Chief Surgeon's recommendations [?] that everyone in Porto Rico be required to be vaccinated, the Commanding General has issued an order directing that this shall be done. A vaccine farm is now [?] being organized under the immediate direction of this office [?] by Dr. Azel Ames, Acting Assistant Surgeon, U. S. A., and it is believed that all the virus necessary to vaccinate the entire population can be produced at a small cost." These statements were, to say the least, in advance of the truth.

General Henry, a man of strict veracity, states that his original order for general vaccination, sent to the *Alcaldes* through the circular of the Secretary of State and of which all later ones were chiefly confirmatory, was issued by him entirely on his own motion, through fear of an epidemic, created by the intelligence received from the *Alcaldes* themselves and without knowledge of any suggestion of his chief medical officer. The medical and sanitary functions of the latter, the General held, were properly confined to the troops, except as otherwise specially assigned, while it was his declared purpose that the civil sanitary work should be conducted by the *Alcaldes*, local boards of health and the composite health board, with general insular powers, created (by General Order No. 37), Dec. 28, 1899, the day previous to the issue of the "Circular" of the Secretary of State. Of this Insular Board of Health the General unwisely, in the writer's opinion, declined to make his Chief Surgeon a member.

The criticism of the Military Governor expressed by the Chief Surgeon to the writer on this same date, January 7th, for issuing the circular order for general vaccination "before he knew where he could get his virus and what it would cost," the Chief Surgeon expressing the opinion that "it would cost \$100,000 to get it from the States and be of little value when got," the writer, reducing this to \$60,000, seems to confirm the statement

*It is an amusing and interesting fact, illustrating for the thousandth time how often little would be accomplished by the "men in the field" if obliged to wait for "orders from the seat of Government," that, although the permission of the War Department was given General Henry March 30, 1899, reaching the Island April 6th, for the expenditure of \$30,000 from the insular fund in the work, he had long before assumed responsibility; on the latter date 19,500 virus points were charged from the cattle at the farms and transmitted to the vaccinators then at work in all parts of the Island, as they had been for weeks, while the very sage advice of the then Assistant Secretary of War, as to the conduct of operations, had long been anticipated and greatly improved upon. In fact, the authority at Washington was not at any time of more than trivial assistance, though its interferences were several times most embarrassing, as in the sudden and peremptory discharge of trained men; the furnishing of poor (initial) virus; delay in the transmission of supplies, etc. Had success depended upon this authority it would never have been realized.

of General Henry that the thought and purpose of universal vaccination of the Island were his own, and hence to determine his right to the honor of originating the great work. The facts seem also clearly to indicate that the Chief Surgeon did not consider the undertaking feasible with virus from the United States, as stated in his report of 1899, pp. 4-18, and it is certain he had no thought that the necessary virus could be produced in the Island until proposed by the writer. The facts surely do not justify the claim of Colonel Hoff made in his own behalf, in the Philadelphia "Medical Journal" of April, 1900, where he says: "The work of vaccinating the entire population of a country, which was inaugurated here (Porto Rico) by the writer," etc., nor can such claim be successfully maintained as against that of the late General Henry.

On the evening of January 7th, at the urgent request of Colonel Hoff, the writer sought the Commanding General and first made the suggestion, already given Colonel Hoff, that the virus be produced in the Island. The suggestion was warmly approved as soon as fully understood, the General saying as the writer left, "I will give you all the authority you need, all the men you need and all the money you need, if you will give me that virus and give it to me soon." These promises he fully redeemed.

From the foregoing it is evident that in writing to the Surgeon General on January 7th, "A vaccine farm is now being organized" (it was but that evening suggested to the General Commanding) the wish of the Chief Surgeon was father to his thought, a fact proven by the dates of the successive orders relative to the Vaccine Station and farms at Coamo Baths, which dates become of importance in the history of the undertaking and determine the time occupied in "wiping out" the disease.

Late on Saturday evening, January 7th (and so constructively on the morning of January 9, 1899), the writer received the verbal orders of General Henry (afterwards confirmed as of this date, by S. O. No. 13, Department of Porto Rico), to proceed on his own suggestions with the preliminary inquiries incident to the creation of the vaccine plant. Hence the statement of the 7th, made to the Surgeon General, "A vaccine farm is now being organized under the immediate direction of this office by Dr. Azel Ames," etc., hardly comports with the facts, as until January 26th, everything done in this connection was by direct order of the General himself, who took from the first the keenest personal interest in the project. Having received the above verbal orders, the writer reported to Colonel Hoff the results of his conference, also urging that the oversight and direction of the vaccination should be placed in charge of the Chief Surgeon of the Department, as the liberal use of the Army Medical Corps and the free use of Army men and material would be absolutely necessary to success. To this proposition the General, after a time, gave a reluctant assent, premising that it must be an Insular (civil) undertaking, conducted through and in co-operation with the *Alcaldes*, though having from the Army all possible assistance.

As the result of this report and to secure the requisite orders, the Chief Surgeon sent on January 9th the following communication to the Adjutant General of the Department.

"Sir: I have the honor to recommend that a sufficient amount be allotted from the civil funds to permit of the immediate starting of a vaccine farm here, to render effective the order requiring universal vaccination among the people of the Island; and that Dr. Azel Ames, Acting Assistant Surgeon, be placed in immediate charge of the work." The *practical* inauguration of the vaccination of Porto Rico seems to have dated with the proposition to produce the requisite virus in the Island.

Having selected the field of his cattle operations (the equilateral triangle of fine cattle-country having its apex at Coamo Baths and for its base-line the south, Caribbean, shore of the island, stretching eastward from Ponce some thirty miles); having chosen his immediate assistants and largely perfected the working plans for the production of a million vaccine points, the writer reported the same to the General Commanding and after a long conference with the Chief Surgeon over plans of vaccination organization, etc., asked for the issuance of orders putting the entire work into its essential relation to the military authority, and under the general charge of the Chief Surgeon.

On January 26th and 27th orders were issued carrying the organization agreed upon by Colonel Hoff and the writer into effect. The General Order (No. 7)* of January 27th reaffirmed the previous orders, civil and military, directing universal vaccination, placing the work under military supervision and conduct, though under civil auspices and the conjoint control of the *Alcaldes*, the great, earnest, organized campaign against the fast-spreading epidemic was begun. The working forces were soon in the field and from this date the work never stayed until it ceased, because completed, on July 1st, just five months later, the population vaccinated, the disease literally "starved out" and driven from the island.

The Virus Production.—The Chief Surgeon (Colonel Hoff) in his report of 1899, has truly said: "To produce the virus a vaccine farm was necessary; to introduce it into the arms of several hundred thousand people required a subdivision of the island and the assignment of Directors, etc. * * * * But the infinite detail of the work and the herculean labor, mental and physical, entailed in carrying it to a successful result cannot be appreciated by those who have never had a like undertaking to accomplish."

To create the virus was, of course, the prime necessity. The grand scale on which the operations were

conducted, practically in the open air, in a new country, by unskilled hands, the speedy accomplishment and the unparalleled success, perhaps entitle this part of the undertaking to more than passing notice. After a thorough inspection of every feature of the Vaccine Station and farms, General J. C. Breckinridge, Inspector General of the United States Army, wrote (report, 1899, to the Major General Commanding the Army, p. 68): "On the morning of the 23d [March] we examined the Vaccine Station under the charge of Dr. Ames at the Baths of Coamo. * * * It seems one of the best energized and organized and, despite the considerable difficulties, the most successful and thorough undertaking that has characterized the American occupation." To establish and keep in full operation the Distributing Station of the United States Vaccine Corps and the adjacent cattle farms indeed demanded the exercise of much judgment, careful planning, effective organization and hard work. To get together the requisite number (1,240 head) of young cattle as needed, to handle successfully, select, test, feed and use them, at minimum cost and loss, in a strange country and with green hands, presented a series of practical problems each of which afforded ample scope for every faculty and acquirement. The detailed story of the accomplishment of each would furnish a set of picturesque sketches of men, incident and environment replete with interest, but not essential to our present purpose.

It was first of all necessary to secure the supply of young cattle without great cost, which would of itself have been prohibitive, to locate them conveniently and subsist them for a considerable period; to procure from the United States, 1,800 miles distant by sea, the best possible lymph with which to vaccinate them, together with the appliances needful for vaccination (ivory points, packing material, etc.) and for pathological tests (tuberculin, syringes, etc.). It was equally necessary to organize, fully equip, house and subsist a corps of over one hundred men, with expert pathologist, physicians, cattle experts, assistants and teamsters; to arrange for regular supplies of all kinds; for large numbers of draft and saddle animals and their equipment, and for efficient transportation, all under military order and discipline; and finally, to keep the whole so effectively at work that there should be, as nearly as possible, a daily output of not less than 16,200 charged virus points from the farms, of which 15,000 must be sent daily, carefully registered and packed, to meet the requirements of the vaccinating forces, steadily and systematically at work in all parts of the island.

The objects to which all lent the utmost endeavor were to turn out daily the needed amount of the very best lymph; so to handle, keep, and transmit it that it should preserve its virility and in competent hands and conditions successfully do its work, and, finally, both to keep and transmit with each package of virus the full record of its production, that the origin and full history of every "point" used might be known to its user when desirable. The difficulties to be overcome, suggested by the Inspector General, were neither few nor small, but are in part enumerated here, only that any who may be called in the future to a similar undertaking, heavily handicapped, need not be dismayed.

Glanders and farcy were spreading in the Government corrals from which it was necessary to take the first fifty or more horses and mules, necessary to the very vital transportation of station and farms, and, being dangerous to both men and animals, were for a time the source of much anxiety. Many of the principal supplies, such as the ivory "points," the initial virus, the tuberculin, gutta percha, and other packings, instruments of all kinds, formalin, chloroform, medicines, fresh meats and other food, had to be brought from "the States." Fresh

General Orders No. 7.

HEADQUARTERS DEPARTMENT OF PORTO RICO.

San Juan, January 27, 1899.

I. The inhabitants of this island must be protected from smallpox. Every resident who has not had this disease will be vaccinated, and hereafter all infants must be vaccinated before reaching the age of six months.

II. The Chief Surgeon of the Department is charged with the duty of providing the material and carrying out the details necessary in the work of vaccination.

III. The following-named officers of the Medical Department are hereby appointed Directors of Vaccination and assigned to the designated divisions for temporary duty:

Major P. R. Egan, Brigade Surgeon, U.S.V., to the Division of Guayama, and of Humacao, south of the Municipality of Naguabo and including Vieques, with headquarters at Guayama.

Major George G. Gross, Brigade Surgeon, U.S.V., to the Division of Arecibo, with headquarters at Arecibo.

Captain Charles Willcox, Assistant Surgeon, U.S.A., to the Division of Mayaguez and Aguadilla with headquarters at Mayaguez.

Captain F. P. Reynolds, Assistant Surgeon, U.S.A., to the Division of San Juan and of Humacao, north of and including the Municipality of Naguabo, with headquarters at San Juan.

Acting Assistant Surgeon Axel Ames to the Division of Ponce with headquarters at Coamo (promoted Major during the work).

IV. In addition to his duties as Director of Vaccination, Acting Assistant Surgeon Axel Ames will take charge of the production and distribution of the necessary supply of vaccine virus.

V. The above named officers will report by letter to the Chief Surgeon of the Department for the necessary instructions in the performance of this duty.

VI. All Medical Officers serving at posts in the different divisions are hereby detailed as Inspectors of vaccination and will report, when their services are required for this purpose, to the Directors of their respective divisions. The care of the sick of the command must not be neglected in performing this special duty. All other officers will render any assistance they may be called upon for in facilitating the work of vaccinating the people.

VII. Inspectors of vaccination will report to the Chief Surgeon of the Department any neglect on the part of the civil authorities to carry out this order, with view to such action as may be deemed necessary by the Department Commander.

By Command of Major-General Henry:

FRANK MCINTYRE,
First Lieutenant 10th Infantry,
Acting Assistant Adjutant General.

beef and ice in large quantities had to be regularly supplied and were teamed almost daily, twenty-three miles up the hilly military road, to the camps. Competent men (though all inexperienced) and good cooks must be found, able to stand severe physical strain for months, while a large part of the necessary plant, such as vaccinating-tables, packages, etc., had to be designed by the writer and constructed by the local mechanics. Refrigerator service and appliances, while most essential, were almost without existence and had at first to be crudely created, and it was matter of extreme difficulty so to keep, pack, and transmit the fresh lymph under the tropical sun that it should arrive at its destination still virile. Severe drought and consequent low water and short pasture were grave troubles, and at one time seriously threatened to stop the work.

The screw worm, the larvae producing which are laid in all abraded and open wounds of bovine animals in Porto Rico, speedily hatching the worms in great numbers, gave infinite trouble. These worms burrow deeply if neglected and rapidly destroy the soft tissues and even the life of the infested animal. It was perhaps the most serious of the troubles encountered, doubling anxiety and labor and much increasing the cost. The sudden loss, by peremptory General Order of the War Department discharging them, of a large part of the most competent men, largely of the Army Hospital Corps, was utterly demoralizing and for a few days threatened to disrupt the work. It was necessary in many cases to hire the same men at double wages as civilian employees, leaving only contract control over them. Losses of cattle by escape and theft and insufficient camp-guard; the necessity (because new ones were not received) of re-using old points weakened and curled by the thorough processes of cleaning, and the drinking and gambling habits of a small percentage of the men, were all considerable difficulties at times, where absolute regularity and system were indispensable. The initial difficulty and a cause for a time of the utmost anxiety was the character of the lymph sent from "the States" with which to vaccinate the cattle. Experience had shown all virus so sent to be of doubtful value; nearly all, especially the glycerinated, had proved inert, and it was a serious matter to bring together such an assemblage of men, cattle and materials, the success and utility of which must all hinge upon the virility of the initial virus. Happily, enough proved virile to start the local stock and secure safety, though not before those in charge had experienced a great alarm and had learned some new facts as to cattle vaccination in the field.

After some forty cattle had been duly tested and vaccinated and the proper time of incubation had elapsed, search was made for the hoped-for typical vesicles which one is accustomed to see upon vaccinated calves. Not one was to be found and the disheartening indications were that all the virus from "the States" had failed, as indeed most of it did. Twenty-four hours later, unwilling to believe that all had failed and that the undertaking must be abandoned, another and most careful search was made by the writer and Dr. Timothy Leary, the invaluable pathologist, which changed deep disappointment into jubilation, for though no vesicle was then or afterward discovered, plenty of typical crusts or cones were, which, being removed, gave typical lymph-yielding bases in abundance. It soon became evident that the heads of the cattle not being confined as in vaccine stables in the United States, their rough tongues doubtless broke the vesicles as soon as formed, as did also the underbrush, and the rough stubble and coarse grass on which they lay. The crusts resulted, and from their indurated ring-like bases the

finest lymph freely exuded and was gathered in great quantities, the "output" of the farms reaching the surprising figures of 27,000 (double) charged points for a day.

The very remarkable and carefully recorded experience determined conclusively several basic facts as to vaccine-lymph and its use, viz.: (1) That vaccine lymph, especially when glycerinated and in tubes, will not retain its efficacy when exposed, even very briefly and without great variation of temperature, to the change from a temperate to a tropical climate. Though the reason does not appear, the fact is indisputable, and all countries in the tropic zone should produce their own virus if so fortunate as to start a "stock." (2) That given virile initial lymph and good cattle, the very best of lymph can be produced by practically the same methods in the tropics as well as in colder countries, provided care is taken to protect it as soon as taken and until used from alterations of temperature. (3) That the glycerinated virus has nothing to recommend it for tropical use, if it has anywhere, and that glass-tubes are worse than useless. (4) That a good, carefully-kept virus has in the tropics equal if not greater activity and efficacy than that in northern latitudes, though it ought not to be kept as long. (5) That it is much better in the hot countries, especially, to confine the vaccination upon animals for virus to a definite number (say twenty) of abrasions on each side rather than to make linear incisions and secure thereby many lines of vesicles. In the first place the specific fever created is too great and is most undesirable, while the ravages of the screw worm, if it effects a lodgment in such extensive incisions, are difficult to manage. (6) That in field work nothing is so good with which to vaccinate an animal as the ivory point, the tube being useless, and nothing is so good to take virus with. Surely nothing is so serviceable for the vaccination of the people, or practicable in a hot country. (7) That there is every warrant for positively asserting that although syphilis, tuberculosis, elephantiasis, and tetanus are common in Porto Rico, in no case has it followed that any of them, or any other disease, bovine or human, was imparted to an individual by the process of vaccination. With tetanus so common in the island that 818 cases occurred in seven months of 1900-1901, a single case only (in an infant) occurred after vaccination in 860,000 vaccinations, and this, of course, would have occurred as readily with any abrasion. (8) That it is not advantageous to use cattle older than yearlings, and that the sexes are of equal value. (9) That it is of importance, and well worth the little it will cost, to keep a good "stock" of vaccine lymph alive in any tropical country, especially if insular, even when little or no large demand exists. The frequently recurring demands for virus for infants and those who will be revaccinated, if wise, call for more or less lymph and emergencies can soon be met if a good stock is maintained, as it easily can be.

Vaccination of the People.—Of course, in such a country and with people in such circumstances, the difficulties of organization and work were many and some of them novel. The long habit of submission to authority, the experience already had at the hands of the Spaniard, who had really made some commendable efforts at general vaccination in former years, but had failed, and the wholesome respect for the American officials, doubtless all contributed to minimize opposition and secure obedience to orders. The rapid spread of the disease and its high mortality also counted; but the master-stroke which secured prompt and personal interest in being vaccinated was the promulgation of a

circular, now famous as "No. 3,"* prepared by the writer and issued by General Henry, which made the possession of a vaccination certificate a prerequisite to employment or pleasure. As soon as it was made evident by this "circular" that it was to be made a bread-and-butter matter, from hills and valleys, hamlets and municipalities, young and old flocked to the vaccinators wherever located, and fairly tumbled over each other for precedence. Often two or three hundred, old and young, would be still waiting unvaccinated, when darkness closed the day's work and these in some cases were not reached for a day or two, camping down where night found them for the next day's chances. Sometimes the vaccination was continued by lamp-light to relieve the pressure.

To the *Alcaldes* and their assistants, the *comisarios de barrios*, and to the local physicians and their *practicantes*, much credit is due. Few of them knew any English, and that they so nearly comprehended and carried out the plans and instructions of organization and accomplished so much effectively is indeed matter of surprise. The *Alcaldes* were charged with appointing the physicians and their *practicantes* (the vaccinators) on the nomination of the Directors of the several Divisions; with providing clerks, assistants, rooms, and conveniences and with the most important duty of distributing the fresh virus, daily received from the Station, to the several vaccinators wherever at work in their respective *Alcaldías*. The service was marvelously well performed, largely by foot-runners, and with a degree of success that would have been impossible to any other agency.

Vaccination is of course much the same wherever performed. There were, however, no breaking tubes, no dull and dirty lancets, no diluted and sophisticated virus, but in their places the clean, freshly-charged ivory "points" with nothing but pure lymph on their faces, their sharpened edges most excellent substitutes for the always suspicious lancets, with full records of the work done, and neat durable certificates.

Among the new and notable features developed in the vaccination itself, were the following. (1) Contrary to the fact in northern cities and towns, and even in the country, house-to-house vaccination was practically impossible, except in very few places, and the people must, as a rule, come to the vaccinators, the necessity for having their certificates being the prime check upon them. (2) Vaccination with the sharp edges of the virus "points" was alone practicable under such conditions. (3) The danger of infection of the abrasions made, even when but little preliminary effort at cleansing occurred, was practically *nil*, but it became considerable from dirty finger-nails, clothing, etc., when the vesicles formed and scratching resulted. Yet in no case were there really serious results, notwithstanding hot water is nowhere available. (4) Cleanliness and light antiseptic dressing were all sufficient to prevent in-

fection and hot water freely applied was equal to the reduction of all undue inflammation, even in the worst and dirtiest of regions.

There is possibly some warrant for the belief that when smallpox is prevalent vaccinations "take" most readily. Certainly an unprecedented percentage of successful vaccinations (87½ per cent.) accompanied the Porto Rican epidemic of 1899. Doubtless the fine quality and entire freshness of the virus, the care with which, under explicit instructions and inspection, the work was done, and the fact that records were kept and certificates given, contributed chiefly to this highly gratifying result. Twenty-two cases were recorded of persons successfully vaccinated who were "seamed and furrowed" with confluent smallpox. This, of course, indicates clearly that the immunity usually conferred by the disease itself is not always permanent, even though the first attack be severe, as there can be no doubt that a person susceptible to *vaccina* is equally so to *variola*. A few cases of smallpox were reported in persons who had evidently had that disease. Such are, of course, extremely rare.

That the protection of vaccination against smallpox "wears out" more or less speedily in different individuals and that revaccination is therefore required at varying intervals were determined beyond cavil by abundant evidence. Numerous cases were observed in which the patient was not vaccinated until after exposure to smallpox and, being taken ill with the latter, the vaccination in every case clearly operated to modify the attack, and in some cases to cause the *variola* to abort, usually in the third stage. Many hundreds of persons presented themselves for vaccination who claimed, with apparent truthfulness, to have had repeated attempts made to vaccinate them without success, but who took perfectly in 1899. Whether previous efforts failed from want of care or skill, or from inert virus, or because of the insusceptibility of the person, it is, of course, impossible to say. An interesting illustration of how effectively the best intended efforts may defeat the object in view was furnished by a list of seventy-two persons vaccinated in one of the hill-towns. Their arms were cleansed, under the printed instructions of one in authority, with a solution of bichloride of mercury. Not a single vaccination of the whole number took, though made carefully and with fresh virus. The facts being learned a revaccination was ordered and the entire number was successfully vaccinated when the bichloride was left out.

Not a few cases were noted in which young children had evidently received immunity before birth from *variola*, their mothers having had the disease while they were *in utero*, and a few cases were found in which vaccination had apparently given exemption to the child from that disease through similar conditions. Repeated attempts made with great care to vaccinate such children and even young adults proved in every case ineffectual, though previous vaccination was positively denied and no evidences of it could be found.

No death from *variola* of any who had been successfully vaccinated in recent years was reported among those ill of the disease, and in but few such cases was there much disfigurement. In no case did serious results of any kind arising from the vaccination itself follow vaccination or revaccination. "Bad arms" were invariably found to be the result of needless infection from filthy or careless habits. Attempts at vaccination are never to be recklessly counted as vaccinations and absence of susceptibility is never to be inferred until repeated competent efforts made with tested virus without results have reasonably determined its non-existence.

Summary.—In October, 1898, smallpox was endemic in Porto Rico; in December it was epidemic; in Janu-

*Circular No. 3.

HEADQUARTERS DEPARTMENT
OF PORTO RICO.

San Juan, March 18, 1899.

The *Alcaldes* of the several jurisdictions of the Vaccination Divisions of this Department are required to use all their authority to secure prompt compliance on the part of the people, with the order of these Headquarters requiring all the inhabitants to present themselves for vaccination when notified. Any persons failing to so present themselves, either for vaccination, or examination afterwards, as directed, will be punished.

No person who cannot present a duly attested official certificate of vaccination after the date when the official vaccination in his or her barrio or district, is completed, shall be admitted to any school, public or private; shall travel by any public conveyance, visit any theatre or any place of public resort, engage in any occupation related to the public, or receive employment.

All school teachers, managers, employers and others affected by this order, will govern themselves accordingly under penalty.

By command of Major-General Henry:

W. P. HALL,
Adjutant General.

ary, 1899, it had "honeycombed" the island; by February there were over 3,000 recent cases and the disease was spreading at a gallop.

In February systematic compulsory vaccination, carefully and scientifically conducted and recorded, was begun simultaneously and with pretty equal efficiency in all parts of the island. It was vigorously prosecuted for four months only, till July 1st, when 860,000 vaccinations had been made in a population of about 960,000. Of these 87½ per cent. were successful. The work then ceased, because completed; the disease had practically disappeared; the fuel for it to feed upon had been consumed by the "head-fire" of vaccination. In the two and a half years that have since passed, instead of the former annual average death-rate of 621, the mortality from smallpox has been, as stated, but two per annum in a population of nearly a million. Can any honest, intelligent person doubt in face of these indisputable and easily verified facts what it was that in four short months drove smallpox from its long-time reign in the island and has since kept it out? *Vaccination alone did it and will do it effectively wherever compulsory legislation, properly enforced, secures its benefits to all.*

ORIGINAL ARTICLES.

CLINICAL EXPRESSION OF CHRONIC MYOCARDITIS.¹

BY J. H. MUSSER, M.D.,
OF PHILADELPHIA.

JUST as chronic myocarditis may exist without physical signs, so it may be devoid of clinical expression; on the other hand, the symptoms may persist for years and be the most distressing and terrifying that can possibly occur to man.

It must be remembered that in the states to be considered an appreciation of the true cardiac condition can be possible only by considering the etiological circumstances. A diagnosis can be established only when the case is considered on broad grounds. It has been stated that the male sex predisposes, for in men the causes are operative, as their too often strenuous life invites the affection. Overeating, indulgence in alcohol and tobacco or perhaps tea and coffee, further prepares the way; syphilitic infection is also a too common etiological factor; gout and rheumatism are undoubtedly etiological associates. In short, all those antecedents which lead to arteriosclerosis may also be considered as etiological factors in myocarditis, for the former is antecedent to the latter. Hence, too, we consider age, after fifty, and the upper walks of life as elements of etiology of value in the diagnosis.

It does not necessarily follow that a patient with endarteritis will have myocarditis, certainly not clinical forms of myocarditis. In the Philadelphia Hospital we see the most advanced cases of atheroma with often no associate heart symptoms, or very few histological evidences of myocarditis after death.

The following conditions obtain in myocarditis:

I. A person may have chronic myocarditis in an advanced degree without any symptoms.

Death may be due to other causes, as an intercurrent affection, an infection, a terminal nephritis, or one of the many phases of endarteritis. The final termination may be "cardiac" and yet the myocarditis may not be the cause of the symptoms or of the dissolution. Thus, coronary artery disease with obstruction by thrombus frequently causes death in cases of latent, and sometimes of advanced, myocarditis.

II. Often the presence of a previously unsuspected myocarditis is not made known either by signs or symptoms except in or during the course of an infection, as pneumonia, or of a toxemia, as gout. An arrhythmia, an unsuspected dilatation, syncope or bradycardia, may be brought out by the toxemia or the infection. This process and its extent in the heart make for woe in the course of the intercurrent disease.

III. The clinical expression may be effaced by the phenomena, which have elsewhere been referred to, of an associate or primary valvulitis, a nephritis, an emphysema, or an arteriosclerosis.

Combined with the cardiac symptoms of myocarditis, to be referred to later, we may have the symptoms of chronic nephritis of pulmonary emphysema, of advanced valvulitis with failure of compensation. Again, the symptoms of endarteritis in other parts may obtain, alternating in character and constancy and interchanging with symptoms of the aforementioned conditions. Now a cerebral thrombosis, then the same condition of an extremity, again uremia and then an apoplexy, or, perhaps, phenomena of coronary artery disease (previously referred to) may close the scene. Such shifting of scenes and complexity of phenomena require a clear conception of the associate or concomitant processes in senile or sclerotic myocarditis and intensely increase the interest in its study. It is well to dwell upon these associate and more frequently dominating features, for only by realizing the pathological lesion in the background—the endocarditis and secondary myocarditis—can the nature of the phenomena be recognized.

IV. The clinical expression may, on the other hand, be simply the phenomena of senility.

V. The symptoms to be discussed are those which, singly or combined, usually the latter, compel the patient to seek relief. They are the *cardiac symptoms of myocarditis*.

I. *Heart Tire.*—As seen in cardiac debility, this is out of proportion to the evidence of senile decay elsewhere. There is breathlessness, edema of the feet, syncopal attacks or anginal attacks. Local anemia occurs, hence the functional activity of organs, as the brain, is in abeyance. Digestive disturbances, renal insufficiency and cerebral inactivity occur singly or combined. The syncope occurs on the slightest exertion, as straining at stool, rising up in the bed, or turning from side to side; the breathlessness on any attempt to walk, often, even, to use the upper extremities. Weakness out of proportion to the seemingly strong appearance of the patient is characteristic.

¹Continued from page 53.

Tremor cardis may be present; palpitation is not infrequent. Tachycardia is the rule and the pulse is small and feeble.

2. *Dilatation of the Heart.*—The dropsies, the effusions, the congestions, the enlargement of organs, the functional derangements, coming and going, soon permanent, with the physical signs of cardiac dilatation, are well known and need no further exposition. It is interesting to note, however, that if such symptoms arise it is unusual to have anginal symptoms. If, however, in these dilatations, digitalis is administered to the degree of inducing a hypertrophy, cardiac pain not unlike that of angina is induced. After long dilatation, its immediate symptoms may be relieved and then those of secondary sclerosis of other organs, as of the kidneys, arise.

3. *Angina Pectoris.*—(a) A person with myocarditis may have one attack of angina terminating in death without premonitions of cardiac disease. They are the cases in which there is often found, associated with the myocarditis, extensive coronary artery disease, death being due to thrombosis. (b) The paroxysms may continue for twenty-four or forty-eight hours, before death closes the tragic scene. J. C., aged seventy-six years, endarteritis and myocarditis; had six paroxysms in seventy-two hours, perishing without other symptoms. R. M. G., aged sixty-four years, had epigastric pain one night; worked hard the next day; had several attacks the following night and died at 10 A.M. of coronary thrombosis. Arrhythmia frequently attends the breast pang. It may have preceded the angina for months or years. Dyspnea might also, although not necessarily, have been a forerunner, occurring either on exertion or at rest. It is not common to see the forms of dyspnea which will be described later, attended by shock and so often terminating fatally, associated. Nor do we usually see in these subjects of this rapidly terminating form of angina the cardiac asthma of dilatation nor the nocturnal form of dyspnea due probably to the same cause. We do see dyspnea from pulmonary congestion developing in the status. When the angina vera is replaced by angina sine dolore we have asthmatic attacks in most of the cases. In rare instances the first paroxysm is followed by rapidly recurring attacks, increasing weakness of the heart and death in cardiac asystole or the ingravescent asystole of Balfour. Houchard describes the condition as *l'état de mal angineux*. S. H., aged fifty-nine years, seen with Dr. Stryker; usual antecedent history of overwork, excessive strain, indulgence in food and tobacco; had glycosuria in 1898-1899. In fall of 1901, had several attacks of angina, very characteristic; he consented to rest in bed in November, and this soon relieved the increasing paroxysms; but, while under observation, the heart dilated; paroxysms of dyspnea did not occur, but the lungs became congested. No angina occurred. He died suddenly while in a recumbent posture, perhaps from thrombosis. (c) The paroxysms continue

for several years. John Hunter suffered for twenty years. During the interval the patient will suffer, as in the preceding cases, from arrhythmia and the forms of dyspnea observed in that class. No other cardiac symptoms arise except in very rare instances. Thus X. Y., seen with Dr. Ferguson, had paroxysms for one year; arrhythmia and dyspnea. Death in one of the paroxysms without other cardiac symptoms. Pronounced dilatation may occur with the marked symptoms belonging thereto. On the other hand, it is usually the case that other symptoms or accidents of endarteritis do not occur. Thus, an anginal subject does not die of apoplexy; again, a prolonged intermission may occur in the attacks of pain, but if arrhythmia has been present, it does not subside. The dyspnea, except on exertion (dyspnea of dilatation), may be in abeyance. Indeed, subsidence of the pain is usually due to moderate dilatation as indicated by the symptoms and physical signs.¹ One of my patients, suffering for one year from angina, arrhythmia and dyspnea, and having the physical signs of myocarditis, had a severe attack of gangrenous appendicitis, for which he had to undergo an operation, and from which he had a long convalescence, during which time he was free from pain and dyspnea for six months, when the attacks recurred, followed by death in one of the paroxysms. (d) Occasionally we see angina sine dolore, as first described by Gairdner, the incident occurring in myocarditis with moderate dilatation.²

Duration.—Notwithstanding this intermittency of paroxysms a patient who has had one attack of angina is almost invariably doomed. I have seen life prolonged four years, but I should say eight to twelve months is the average duration of life after the first attack. As already mentioned, it is curious that death is due usually to the angina and to no other condition. The state, apparently, does not invite the terminal infections which occur so frequently in the course of cardiac dilatation due to myocarditis.

Symptoms.—The features of an attack of angina pectoris have been so well described by its earlier historians and so exhaustively reviewed recently by Osler, that it is not necessary to lay them before you. Moreover, we usually engage but a short time in practice, before we become by dint of our own observations familiar with the picture of a paroxysm. This is particularly true if our practice be among the better class. A considerable experience, however, leads me to believe that practitioners, on the one hand, do not take cognizance of nor place in their true relationship to etiological facts and physical conditions the slight attacks of pain or cardiac distress which are called "anginal." On the other hand, the malady is so terrible that they hesitate to pronounce its true nature and resort to neuralgia, "tobacco

¹ Muser, *Angina Pectoris*, Trans. Assoc. Phys., X, p. 82.
² Loc. cit.

heart," indigestion, rheumatism, and other evasive terms to explain the symptoms. It is true, too often, the patient struggles with a paroxysm during the night, and because of some associate gastric symptoms, as flatulence or nausea, places so much stress upon this feature as to mislead the physician. Moreover, his own perceptions of the phenomena of the attack are obscured by the stuporous state of the mind and the lethal state that follows. It is a good working rule to consider anginal all nocturnal bizarre attacks of chest pain, epigastric distress or even indigestion, unless a definite cause can be determined, if other features of the picture are present. Too often we must recognize in medicine the drama of "Hamlet," without the presence of the Dane. The picture must be recognized by its frame and the minor coloring; some filling in must be done by the observer.

It is a melancholy fact that doctors, the victims of this disorder, usually attribute their symptoms to some gastric disorder or otherwise explain their discomfort. Dr. S., aged fifty-seven years, suffered for five months without advice, thinking the paroxysms were of gastric origin. Those of us who see even the earliest signs—mutterings of the storm—must buckle on our courage and, in justice to the patient and family, explain the nature of the ailment in full. We must be just and therefore brave.

The following case was thought by the attending physician to be one of indigestion.

Angina Pectoris.—February 21, 1898, L. H. S., aged sixty years. Temperate; no tobacco, discontinued its use ten years ago. Not an excessive eater. Drinks water, tea and coffee, the first to excess. Eats regularly but rapidly. Sleep hours are abundant. Saw hard service in the army. Father died of unknown disease, said to be angina pectoris. Mother died of old age. Brothers and sister living and healthy. Had jaundice in army. Had inflammatory rheumatism thirteen years ago. Always well otherwise. Weight 230 pounds; has large abdomen. For past three years pain in epigastrium. First attack attributed to overeating. On exertion, or when excited or nervous, seized with pain in epigastrium; also dyspnea on walking, and when the pain is severe it extends to left pectoral region and to the shoulder and arm, often to the right. Countenance ashy and pale; during attack the face is very ashy and bathed with free cold sweat. No arcus senilis. Pulse, high tension. Some oppression after eating or when talking. No impulse of heart. Sounds indistinct. Dulness upward to second rib and to left nipple line.

February 23, 1898: No pain for twenty-four hours. Strength better.

February 28, 1898: Pain relieved. No pain from Broad Street to my office (eight squares).

March 7, 1898: Constipation, otherwise much better.

March 15, 1898: Much better. No attack of pain except on exertion.

April 8, 1898: Much better. Feels stronger and has not had any pain for some time. Lost

fifteen pounds. No dyspnea. Constipation better. After eating and especially at night, tired feeling and even numbness over the stomach.

May 6, 1898: Much better. Can take longer walks without pain and excitement; letter, telegram, etc., does not increase or excite the paroxysm as formerly. Not nearly so nervous. Not influenced by children around as formerly. Pulse irregular in volume. Some tension. Often in the evening some numbness over abdomen.

Died of angina in the summer of 1898.

Pain in the Arms.—Of the clinical features, I wish to say a word regarding the location of the pain. It is important to consider the arms, one or both, as one of the courses which the agony takes. Sometimes, in the paroxysms, the cardiac regions are not affected, but the extremities are the seat of frightful pain while a paretic sense is complained of. The entire paroxysm may spend its force in this location, or, on the other hand, alternate from precordia to arms.

Jaw Pain.—A., aged fifty-six years, suffered intensely with pain in the jaws with each paroxysm. An anatomist and practitioner of medicine, he believed from his sensations that the pain was due to swelling of the arteries in the bony and fibrous canals of the lower maxilla.

Substernal Distress.—Allied to the anginal paroxysms is that curious localized pain or sense of discomfort which the patients with myocarditis describe as seated in a definite area; that is, it continues in a fixed area until the sense of suffocation is relieved. It bears some relation to dyspnea. J. described it as a circle two inches in diameter above the xiphoid. "Remove that and I am well." C. marked a square of four inches at the lower part of the sternum. The patient did not have paroxysms of angina.

Pseudo-Angina.—The most difficult problem in clinical medicine is to distinguish the true and false forms of angina. In the pseudo-angina of anemia, hysteria, neurasthenia, and the angina vaso-motoria of Nothnagel, concomitant circumstances help us. These forms are fairly easy to differentiate. Toxic angina, more particularly from tobacco, presents more difficulty. This is usually the case because the tobacco subject presents the other features, too often, of endarteritis. Of course we see heart pain in young smokers, possibly anginal, certainly toxic, and perhaps with arrhythmia, relieved by discontinuance of tobacco. Similarly with tea and coffee; they are usually neurotic subjects and have some indigestion, so that we might argue that the phenomena were not anginal or even cardiac. I am, however, beginning to doubt the diagnosis of heart pain from tobacco in old subjects as non-anginal unless there are other signs of nicotine poisoning. I had thought for some time it was possible, and kept before me as confirmatory the case of H. B. S., who had had clinical features and physical signs of myocarditis with angina. His complexion was typical. With the discontinuance of tobacco and with other hygienic regula-

tions and some medication he improved to a remarkable degree. His color became normal, the gallop rhythm and reduplication disappeared, cardiac pain subsided and the dyspnea did not recur. Arrhythmia alone remained, but so lessened that an intermittency of pulse occurred but once in 200 to 400 beats. At the height of his valetudinarian glory, a slight attack of angina recurred and four days afterward he perished suddenly from thrombus of the coronary artery. The following is that part of the protocol of the autopsy bearing on this point.

Pericardium.—Cavity almost completely obliterated by firm fibrous adhesions.

Heart.—Mitral valve measures 10.2 cm.; slight, smooth, nodular thickening at free edges of cusps. Aortic valves measure 7.9 cm. in circumference. Capsule normal. At edges of sinuses of Valsalva there is a yellowish opaque thickening with small projecting calcareous spicules. In the sinuses there is the same yellowish thickening without calcification. Tricuspid and pulmonary orifices not examined. Coronary arteries are irregularly dilated and tortuous, containing yellow, opaque areas, which are more or less elevated. In the left coronary artery, $4\frac{1}{2}$ cm. from its orifice, is a firm yellowish thickening of the intima with some calcification, producing a nodular prominence, and almost completely obliterating the lumen. Adherent at this point and extending for a distance of 1.4 cm. toward the orifice of the vessels is a grayish-red, firm clot producing complete obstruction of the lumen.

Myocardium.—Wall of left ventricle measures 1.7 cm. in thickness. Papillary muscles are very prominent. A portion of the left ventricle corresponding to the distribution of left coronary artery is much softer than normal, more easily torn, grayish-yellow in color, in places distinctly yellow, and opaque; the opacity is most marked in the endocardial and intermediate portions, involving also the left group of papillary muscles. In the midst of this softened tissue can be seen a few small blood-vessels, containing grayish-red clots. Beneath the endocardium of the papillary muscles there is a distinct reddish mottling due to minute hemorrhages. The right portion of ventricle while not so firm, and lighter than normal in color, does not show this softening. Cavity of left ventricle is slightly dilated. Wall of right ventricle not examined.

Anatomical Diagnosis.—Coronary sclerosis; thrombosis of left coronary artery; infarction and acute softening of wall of left ventricle; hypertrophy and dilatation of wall of left ventricle; chronic obliterative pericarditis.

Is it any wonder, then, with this case in view, that I hesitate to pronounce cardiac pain in tobacco subjects who have endarterial settings an innocent toxic phenomenon? In other instances my experience has been similar, and I fail to recall cases of so-called tobacco angina in old subjects without the toxic symptoms of tobacco, that did not turn out to be myocardial.

4. *Dyspnea.*—We see the dyspnea of dilata-

tion, if that condition complicate myocarditis, with or without pulmonary congestion or pleural effusion. It is constant, or it is increased by exertion, or it is paroxysmal and hence usually nocturnal. In the latter instances there is cyanosis and orthopnea, perhaps due to a temporary increase of the pulmonary congestion. It must not be confounded with the toxic dyspnea of nephritis so often concomitant.

Myocardial Dyspnea.—Dyspnea associated with the aforementioned localized substernal distress without true paroxysms of angina. Often, as the patient is seated before you, he will have paroxysms, probably induced by the psychical excitement attendant upon the consultation. It occurs independently of such influence, however, possibly following the taking of food. The patient takes ineffectually breath after breath without satisfying air-hunger until a final full breath satisfies him for a time. "There," remarked M. after repeated labored breathing, "I have gotten over it. I can now breathe easily." Its features are such, with the ashy countenance and the cardiac signs, as point unmistakably to the myocardial condition. One can almost make a diagnosis by the facies and the intermittent dyspnea. It was seen in pronounced form in the case of J. and in that of Walter H. It is true that in such cases there is often nephritis and, hence, it is difficult to attach a true pathological explanation to this symptom. It is remarkable that in many of these cases the dyspnea is relieved after some physical exertion. Thus J. would get relief for hours by a bicycle ride of eight or ten miles. He never, I may say, had angina, but he did have arrhythmia extreme and died of uremia. D. of Buffalo, whom I attended with Cary and Sherman, died of terminal dilatation and nephritis. In the early stages of the myocarditis he experienced great comfort from long bicycle rides. The Oertel principle of therapeutics was empirically discovered and followed in exaggerated form by these patients. It must not be confounded with the curious form of psychical dyspnea occurring in certain forms of indigestion, from gastric neurasthenia.

Myocarditis, Dyspnea, Dilatation of Heart, Murmur in Recumbent Position Only.—G. T., merchant, aged forty-nine years, married, consulted me November 9, 1899. Smoked regularly five cigars a day. No stimulants. Life regular, but hustling. Long hours for sleep. No venereal disease. Has had rheumatism in elbow for years occasionally. Never in bed with any infection. For past five years dyspnea on exertion. Seven years ago attack of flatulence with pain down arms and over chest. Dr. Engel said in 1892 he had fatty infiltration of the heart. I was consulted for the dyspnea, which was continuous and, with the ashy face, made a striking picture.

In August, 1898, on exertion up hill, severe pain in forearm. Dyspnea then began on exertion. Improved in fall. Had been smoking up to August. Always unable to walk after eating and very dyspneic. Had a pain in back dur-

ing 1898 and 1899; never any discomfort on lying on left side. During the last year rose in morning to urinate. Slept well before that. No loss of sexual power. During the last year twitching in arm and neck. Nervous in many respects. Prematurely old, gray, sallow complexion. Not much wrinkled. Temporals prominent. Urine (middle of morning), specific gravity 1015, acid, no odor, no albumin, no sugar. Microscopical examination negative. Centrifuge used. Previous to 1898 rode on bicycle. After four-mile ride felt well; but during first mile had dyspnea. Has had hacking cough and some pain in epigastrium. Father died at sixty-one of Bright's disease; mother died in childbirth. Brothers and sisters all healthy. Parents of father lived to old age. On inspection no impulse is visible. Marked venous pulsation in neck, greater on right side than on left. Palpation, left radial smaller than right; both show high tension. Impulse faintly felt in fifth interspace nipple line. No thrill. No carotid thrill. Area of cardiac dulness begins at third rib and extends to sixth. At fourth rib is 6 cm. wide and at sixth rib 9 cm. On auscultation, gallop rhythm over left ventricle; short and high-pitched sound over right. In recumbent posture, on holding breath, a loud systolic murmur develops at xiphoid cartilage. Muscular element of first sound very weak. Hands are dusky and sensitive to cold. Died suddenly from thrombosis of coronary artery, November 27, 1899.

Dyspnea with Angina.—The often-repeated story, "I walk half a square and then must seek support to get my breath and relief to the breast anguish." One brave fellow walked to the cars from lamp-post to lamp-post. Another used the ruse of shop-window exploitations to disguise his distressed and circuitous ambulations. Usually if the angina occurred when at rest there was no dyspnea. This was not always the case, however, and the interruption to breathing was created by or coincident with anginal paroxysms. This is one of the true forms of myocardial dyspnea.

Angina Pectoris, Dyspnea.—S. H., aged fifty-nine years, seen November 22, 1898. Pain in chest on exertion. Pain in arms, dead and heavy as if struck by a bar. When he starts to go out of office, the pain begins and then settles as a severe neuralgia. Starts to walk and is compelled to rest by lamp-post. Face gets pale. Perspiration starts and hands are cool. Has indigestion. January 19, 1899: Suffering from less rheumatism. Continues to have flatulence. Does not have so much pain in arms and chest as formerly. Sleeps better. Not such severe heart symptoms. No abnormal cardiac rhythm. Large area of gastric tympany. Color of lips bluish.

December 26, 1898: Heart's action rapid, 90 to 100. Accented aortic second sound. No impulse visible or palpable. Heart sounds not strong. No reduplication, but a slight gallop. Artery rounded, but no atheroma. Temporals prominent. Has angina pectoris.

Died May 1, 1901, of angina pectoris. During preceding month had frequent attacks, and since December, 1899, attacks every month.

Dyspnea with Dilatation.—Another form of myocardial dyspnea is that which is often the first premonition of myocardial trouble; it may be during a hard pull on the bicycle or on a mountain climb. After some physical effort, dyspnea occurs with precordial cardiac sensations of fulness or of sinking or with palpitation or syncopal sensations. After a brief rest, it may disappear and not recur for months, or a slight exertion again brings it about. Frequent recurrences become a warning and very soon arrhythmia, angina or dilatation ensues. At first it may be due to temporary acute dilatation or to arrhythmic action of the papillary muscles with asystole.

Myocarditis, Dyspnea, Angina Pectoris.—W. M. H., lawyer, aged seventy years, consulted me January 25, 1899. Not engaged actively in business the past five years. Father died of paralysis; mother died of paralysis at seventy. Two brothers died of heart trouble, one having diabetes also; another angina. Three sisters living in good health. At ten years patient had asthma followed by measles. This continued until the thirty-fifth year. Always had temporary relief by emetic. Since then tendency to disordered liver. Has had constipation and more or less dyspepsia. Within the last year shortness of breath, oppression and dread, and lately a severe attack of oppression. Has been in bed, with oppression. No precordial pain. Never had rheumatism, gout or vertigo. In the past months has lost ten pounds. Has myopia. Patient is large man, of sallow complexion, but no cyanosis. Color of lips good. No edema. Chest emphysematous. Liver dulness eighth rib. Left lobe rather large. Percussion over chest very bandbox-like. Cardiac dulness third rib light; absolute from fourth to seventh and out to parasternal line. Stomach tympany sixth interspace. Apex fifth interspace, not visible and not strong. Right ventricle sounds weak; left ventricle short and weak. No prolongation of first sound. At sternal part of third interspace, slight systolic murmur, not constant. No accentuated second sounds, although distinct aortic. Pulse high tension. The patient seemed to improve under treatment. Four months after these notes were taken the patient died of angina pectoris. Relief from dyspnea had been obtained.

Dyspnea Due to Asystole.—Angina is one of the tragic terminations of a career which has been fraught with the high and often severe duties in the world's battle. Another tragic end is that attended by the paroxysms of dyspnea and shock we are about to describe. Often called "heart failure" or "edema of the lungs" or, wrongly, "congestion of the lungs," one paroxysm frequently ends the battle. Again, the attacks may recur at intervals of weeks or months, the fatal paroxysm not occurring until a year

or two after the original attack. I have seen this continue in rare instances over three years. In one patient, a woman aged seventy-nine, the attacks recurred for five years.

The attacks are characteristic. The patient is suddenly seized with dyspnea. The respirations are labored, but not much increased. A rattling sound attends it, readily found to be due to fluid in the tubes, as the general large and small râles show. The clear fluid pours from the mouth or is discharged easily, if the attack is not to be fatal; with difficulty or not at all, if death is imminent. The respiratory distress is extreme. The patient sits upright; the face is pale; the brow is covered with sweat; the hands are cold and pallid. There is little if any lividity. The temperature is subnormal; the pulse rapid, thready, irregular, perhaps not perceptible at the wrist. The patient is in a state of profound shock. Because of the lung noises, the heart sounds cannot be heard, or only as a confused jumble, or with irregular and ineffectual systoles. Either no change in the cardiac dulness is distinguished or it may be lessened.

In the interval, after full recovery, the patient is fairly free from dyspnea. There is probably some arrhythmia; rarely any angina and dilatation does not supervene. As in angina, the occurrence of one attack is usually the beginning of the end. I have not seen any one live more than five years, and they usually die within the year from the onset, generally from an attack similar to the original, such attacks having grown more frequent toward the end. Of course, a progressive weakness develops, and, as in the case of J. T., nephritis may become a dominant feature. His case is so full of interesting features illustrating the complexity of the cardiac pathology that I may be permitted to cite it.

Dyspnea; Cardiac Asystole; Myocarditis; Endocarditis; Glycosuria; Pulmonary Edema; Rheumatism; Hot Feet; Nephritis.—January 3, 1896. J. T., minister, aged fifty-seven years, married; no children. Father living and healthy. Mother died of gall-stones. Patient delicate from birth to sixteenth year. Always active and in good health since then. Cataract five years ago. Urine examined eighteen months ago; trace of albumin; no sugar. Polyuria past year. Three or four quarts a day. Lost flesh slowly until six weeks ago. Since then on diabetic diet with rapid loss of flesh. Now passes two quarts in twenty-four hours. Feels weak. Skin not hard or dry. Last ten days has sciatica. Thirst great at first; now lessened. No hunger. No indigestion. Bowels not constipated. Tongue furred. Pulse 90 to 110. Faster after exertion. Gallop rhythm of heart. No murmur, second sound accentuated. Liver dulness, upper is one inch below normal and lower is above margin of ribs. Edge palpable; left lobe enlarged and distinctly palpable. Epigastric pulsation. Muscular rheumatism and joint inflammation last ten years.

Hot feet the past three or four months; burn severely. Reflex of right leg less, of left leg absent with atrophy, but atrophy has been present since early life and left leg always weak.

January 8, 1896: Awake at nights with burning heat sensation. No perspiration.

January 30, 1896: Less urine. No loss of flesh last week. No headache. Heat in feet less. Flushes better. Pain in legs; sciatica past four weeks; worse on exertion. Pulse about 80 to 84. Urine slightly less.

February 10, 1896: Sciatica relieved entirely. No sugar, but some albumin in urine. Appetite fair. Bowels regular. Two quarts urine in twenty-four hours.

February 27, 1896: No discomfort after eating. Tongue furred as yet. Formerly sweat much after preaching. This has disappeared entirely. Has held his own in weight and is feeling a little stronger. Appetite fair. Some flushing.

April 19, 1896: Has had several attacks of "heart failure," "congestion of lungs," dyspnea, and shock. Otherwise has improved very much. Night micturition.

April 25, 1896: Pulse 96. Respirations quiet. Felt tired about the chest after some rather unusual exertion. Appetite fair. Urine 1 1/2 quarts in twenty-four hours. Does not get up at night so frequently. Some sciatica.

June 11, 1896: Apex beat not felt. Impulse to right and left of xiphoid and below; character short, sharp, not heaving. Sound of apex inside nipple line. Dulness to parasternal only. Apparently emphysema. No murmur. No accentuated second sound.

December, 1896: Gaining in strength. Sleepless and polyuria. Three to five pints of urine in twenty-four hours. Color better. No dyspnea. Pain in lumbar region and down sciatic nerve. Appetite and digestion good. Heart regular. Bowels constipated. Burning of feet and legs. Must keep feet uncovered all night. Reflex less. Heart sounds strong. Internal sense of weakness gone. No atheroma. Improvement due to rest, the Schott treatment and nitroglycerin.

February 2, 1897: Sugar has now disappeared from urine. At night when he lies down, he must at once begin to urinate and this continues until a quart or more is passed and until this occurs sleep is impossible. The urine is very pale. Is very nervous, although no doubt the apprehension of sleeplessness is the cause.

The patient continued to improve and was lost sight of. It was learned that he resumed a portion of his ministerial duties, and preached successfully. He died in 1899 of "congestion of the lungs."

These attacks of cardiac asystole differ, it seems to me, from those of acute dilatation. The difference is mainly in the following particulars. Had the patient been examined before the attack, signs of myocarditis would have been present in the acute dyspnea of

that affection, whereas dilatation could occur without the presence of fibromyocarditis. In the former, shock and edema of the lungs are dominating features. In dilatation, marked cyanosis is prominent, tachycardia and arrhythmia are extreme, while the lungs are the seat of congestion rather than edema. In dilatation there is congest-spleen, liver and kidneys show it. The urine gives evidence at once of the congestion, whereas the urine is not necessarily nor instantly changed in myocardial dyspnea. It seems academic to discuss the diagnosis of edema and congestion of the lungs, and usually it is not practicable. It must be admitted that very frequently it can not be done. Nevertheless, it seems well to attempt it, for, as one appears to be a feature of myocardial dyspnea (edema) and the other of dilatation (congestion) and as the treatment of each is different, it is well to have an idea of their distinction. I may say in passing that, as I have stood at the bedside of these cases, my feelings were that the edema was largely from impairment of innervation of the pneumogastric nerve, whereas the pulmonary congestion was vascular.

Edema of the lungs is attended by shock, by an abundant, frothy expectoration, by dyspnea without much cyanosis, and by signs of the out-pouring of fluid in the large bronchi rather than in the air-vesicles. Congestion of the lungs is attended by cyanosis, by some cardiac distress, as palpitation, by congestion of other organs, and by the physical signs of moderate filling of air-vesicles with fluid and by frothy, bloody, but not abundant, expectoration. There does not seem to be the same fear of impending death in dilatation. While air-hunger is the same in both—orthopnea marked—it is a necessary attendant of myocardial dyspnea, but not of the congestion of dilatation.

5. *Tachycardia*.—Frequently an unduly rapidly acting heart is due to myocarditis. Usually there is some arrhythmia, but it is remarkable how little suffering may occur, although the heart is beating at the rate of 150 to 180 per minute. Such heart hurry must be distinguished from toxic and from reflex forms of tachycardia. It must be remembered that it is not to be confounded with palpitation, the phenomena of which give rise to actual mental suffering and to local distress. It is one of the essential symptoms of Graves' disease and a common accompaniment of mitral stenosis. Even in the absence of these conditions tachycardia may be a symptom of myocardial strain and may be relieved by judicious management. The great fact to be remembered is that tachycardia may be the terminal cardiac symptom of myocarditis, death resulting in from forty-eight hours to one month after the onset, the end being attended by *ingravescens asystole*, congestions of internal organs proceeding slowly to further embarrass the casual failing circulation. A patient with tachycardia may suffer from tremor

cordis, the sensation of fluttering followed by a systolic shock belonging thereto alone giving rise to distressing symptoms.

6. *Bradycardia*.—Time forbids a description of the interesting syndrome of Stokes-Adams. It is now well recognized that with this slow pulse, syncope, convulsions and pseudo-apoplexy may arise. Patients with this syndrome rarely suffer from angina or from severe arrhythmia. A fatal syncope is the cause of death. A progressive dilatation rarely takes place. The syncope may be hastened by exertion or by excitement. Thus, X. Y. Z., a lawyer, aged fifty-eight years, had two fainting fits at long intervals, then a succession of syncopal attacks, then moderate dilatation with pulmonary and renal congestion; then improvement followed by rest at Atlantic City, at which place a fatal syncopal attack followed a slight bronchial congestion. The pulse was never over 50 and was never irregular. The duration was nine months.

The following case illustrates features of the symptom-complex; here notably arrhythmia and delirium cordis occurred at the end. This is rare, as pointed out by Balfour, although it was marked in the case following the one now to be recorded.

January 16, 1900: S. B. M. The patient was first admitted to the hospital six months ago, shortly after he had had a severe bleeding from the nose. This was accompanied by some vertigo, but after he had been in the hospital a week he was discharged without further symptoms. He was again admitted four months ago, suffering from vertigo and headache with occasional slight syncopal attacks. These were accompanied by momentary paralysis of the arm with numbness and tingling. These symptoms soon disappeared and at the end of three weeks the patient was able to leave the hospital. He was admitted again about two weeks ago, with dyspnea, vertigo and palpitation, and the following history was elicited: His father and mother died of old age; his brother died suddenly at the age of thirty; one sister died of consumption and one of "spitting of blood." The patient had the diseases of childhood, since which time he has always been well and strong. He has led an active life, although there have been long periods during which his occupation has been a sedentary one. He has always used tobacco and alcohol in moderation. He has not been in any business for the past twelve years. He has often had slight rheumatic attacks, but nothing of a severe nature.

About seven months ago he had the violent epistaxis already referred to, with which there was some hematuria. Since then he has had three or four slight syncopal attacks, and is often subject to general depression of spirits. He did not lose consciousness during the slight syncope, and he has not had one of these attacks for three months. He never has had any edema of the feet. About two months ago he began to have dyspnea and palpitation, with some paroxysmal dyspnea.

At this time he also began to have some edema of the feet and legs. He lived on the fourth floor and was obliged to walk up stairs, so that he soon increased these symptoms and began to have marked feeling of oppression over the precordia. He lost some weight and began to have insomnia, due to dyspnea and oppression. There were slight frontal headaches and constipation.

On admission the temperature was 97° F., pulse 40, very full and of high tension; respirations 22. The patient was fairly well nourished, although he was quite pallid and sallow. The temporal arteries were prominent, and arcus senilis was slight. There was no edema, the temperature of skin was good and the hands were cool. The postcervical glands were palpable. Heberden's nodes were marked in both hands. The patient had rather a coarse tremor of head and hands, which was decreased by volitional acts. The tremor disappeared when the patient was asleep. The knee-jerks were increased on both sides, but there was no ankle-clonus. Pupils were equal and reacted sluggishly to light and accommodation. The chest was short and slightly barrel-shaped. The lungs were normal, except for a slight emphysematous condition. The apex impulse of the heart was found in the fourth interspace in the mid-clavicular line, and outside of this was an uncertain impulse. There was an epigastric impulse to left of the median line, but no heaving impulse nor shock on palpation. Deep dulness of heart extended from the upper border of fourth rib above to the apex beat below from half an inch outside of mid-clavicular line in the fourth and fifth interspaces on the left side to one-fourth inch to right of the sternal border on the right side. The apex beat was just palpable. At the apex was heard a rough, long systolic murmur which was transmitted into the axilla. The second sound at the apex was "clicky." The systolic mitral murmur was well heard in all the interspaces above and also at the pulmonary area, where the second sound was weak. The mitral murmur was well heard at aortic area, and here the second sound was split. A mitral murmur was also heard at tricuspid area. The radial arteries were quite hardened.

For two days the patient had occasional attacks of paroxysmal dyspnea and a feeling of oppression over sternum. He had also occasional flushes of head and face. The feet and legs to knees were quite edematous. The pulse became rapid, but at time arrhythmic, in both rate and force. The murmurs were about the same. The general condition had not improved. After admission the pulse-rate varied between 46 and 30, usually being 36 or 38. It was quite full and lasting. There was then much irregularity in rate and force, with frequent abortive systoles. The temperature ranged between 97° and 98.4° F., being for the most part below 98° F. The urine varied between sixteen and thirty-six ounces, and contained 0.05 per cent. of albumin, also hyaline and pale granular casts, and was of a specific gravity of from 1020 to 1030. The feet

and legs up to knees were quite edematous and the patient gradually grew worse. He died suddenly two weeks after admission. An autopsy was refused. It was an undoubted case of myocarditis in the course of valvulitis.

In the case of T. M., seen with Dr. Alrich, the pulse was very slow and the pseudo-apoplectic and epileptiform attacks were very common during the last two months of his illness. The patient, aged seventy-two years, had marked atheroma. The pulse averaged 40. During the attacks of unconsciousness, the pulse would become rapid and irregular. Full systoles would be followed by half a dozen or more incomplete ones. The attack would begin with rapid breathing, cyanosis, tonic and clonic spasms of the extremities, great turgescence of the face, occasional biting of the tongue, stupor, coma of brief duration, followed by an acute sense of exhaustion and extreme aching of the extremities. As many as thirty attacks occurred daily, many without convulsions. For some unknown reason they would be absent for ten days or a week. Excitement always induced an attack. He never had angina.

Slow pulse and cardiac pain, in contrast with the foregoing, may be of toxic origin, as the following case appears to show. The patient made a complete recovery.

Toxic Angina Pictoris, Bradycardia.—F. C. W., builder, aged forty years; February 9, 1897. Until 1895 he drank considerable beer. He took a fair amount of exercise; used tobacco to excess, but had recently lessened the amount. Formerly weighed 300 lbs.; now weighs 240 lbs. Height, five feet six inches. Father living and healthy. Two brothers, both healthy, one very stout. Mother died of cardiac disease at sixty-three, after an illness of two months. Grandparents died at old age. Had intestinal trouble when seventeen years old. Perfectly well except attacks of quinsy since childhood. These attacks have continued up to the present time. For the last four years each fall he has had giddiness and cardiac pain, with slow pulse. Pulse averaged 50, but was sometimes as low as 40. High-tension pulse. Second aortic accentuated. Sounds normal, but impulse labored. Pain in third interspace and at apex. Squeezing sensation. Gets up at night to pass water. Appetite good. Dilatation of stomach. Bowels regular.

February 24, 1897: Perceptible lessening of tension. Much less pain. Appetite fair. Lost four pounds.

March 10, 1897: Better. Much less pain. Weight 218 lbs. Reduced from 230 lbs. No dyspnea. Myalgia in muscles of back. Taking Schott treatment.

April 19, 1897: Has stronger impulse. Apex in fifth interspace outside nipple line. Slight murmur, soft; low pitch. Better as to cardiac sensations.

7. *Arrhythmia.*—Finally, myocarditis may have clinical cardiac expression in arrhythmia alone. Palpitation may attend, but does

not commonly do so; delirium cordis, however, is not infrequent, and death may come after many years from asystole, sudden or ingravescient. In the marked cases early in the ailment it is not uncommon to see dilatation with dropsies, congestion and the physical signs of mitral insufficiency. Improvement may take place for a time, followed by recurrences, and death occur from either nephritis, dropsies and cardiac asthenia, or from a terminal infection. Death from angina is rare; indeed, occurrence of the paroxysms is rare. Dyspnea, however, is common when signs of dilatation arise.

THE SANITARY CONDITION OF STREET-CARS IN NEW YORK.

BY GEORGE A. SOPER, PH.D.,
OF NEW YORK.

Two recent fatal disasters have served to focus a large amount of attention upon the question of public safety on railways in New York City. Referring to the New York Central tunnel collision and the explosion at the Park Avenue tunnel, Judge Cowing, in addressing the February Grand Jury, recently said:

"There are two cases which I expect will be placed before your body for its action and which have not only cost the loss of human lives but greatly shocked and disturbed the peace of this community. Public safety is an important consideration in a city of this size, and to prove this laws have been enacted for the protection of human life which, if they were enforced with celerity and zeal, should make disasters of this kind well-nigh impossible. There is a stage at which negligence of public safety becomes criminal. It is for you, gentlemen of the Grand Jury, to look into these matters with exceeding care and intelligence. If you find criminal neglect on the part of any person, do not hesitate an instant in bringing him before this bar, no matter who he may be, to be judged and punished."

From Judge Cowing's severe words, which fairly represent public sentiment, it might be inferred that liability to disastrous accident was the pending danger of city railway systems, but such in reality is not the case. Without intending to minimize this form of danger, which is great enough to be calculable and should certainly not be ignored, it must be stated that statistics show that great disasters cause a very small proportion of the total loss of human life on railroads.

The importance of railway dangers seems to be inversely proportional to the notice they receive. We hear a great deal about the loss of twenty lives in the smash-up which occurs on an average once in a decade, but we do not notice the loss of the three hundred lives which are snuffed out one by one by the trolleys and other railroads in New York City every year.

And there is another danger which is even less apt to be taken into account by the public. This is the danger of injury to health through the

insanitary condition of our street cars. The importance of the subject is not to be denied. A vast amount of suffering and pecuniary loss is caused by preventable sickness in New York, and evidence is not wanting to show that the street-cars are responsible for their full share in its causation.

Sanitary Condition of Street-Cars.—Theoretically, the trolley car is a sanitary improvement over the public conveyance of a former day, but practically, as it is seen in New York, it is an invention of doubtful hygienic value. If we name in its favor greater size, better heating and lighting facilities and higher speed, we must also take into account the fact that it is not well adapted to carrying the great number of people who ride upon it. Under present conditions, greater size does not insure greater convenience; in the rush hours of night and morning it means greater discomfort. Cars with a seating capacity of from twenty to thirty people often carry from sixty to ninety passengers. How great overcrowding becomes is illustrated by the nightly spectacle of the throngs who seek transportation to their homes across the Brooklyn Bridge. At this point it is not uncommon for people seeking to board cars to be trampled upon; men and women have been killed here in their efforts to find a place upon the trolley-cars.

The sanitary evils of overcrowding are not speculative. From the time of Sedgwick and Farr to the present day there has been a great stream of statistical and analytical evidence to prove that persons who breathe poor air and occupy crowded quarters furnish high death-rates.

Physiological Effects of Poor Ventilation.—The physiological effects of poor ventilation are well known. Air vivified by the lungs is low in oxygen, high in carbonic acid and high in organic matter. Want of a sufficiency of oxygen, combined with the presence of products of respiration in the air, causes a reduction of heart action, increase in the rate of respiration, tendency toward headache, loss of appetite, reduction of vitality, nervous exhaustion, and, in severe cases or in delicate organizations, nausea may be an immediate result of breathing foul air. Many who have traveled in overcrowded street-cars are familiar with some of these effects and are aware of their injurious nature.

The power of resisting disease is lessened.

Poor ventilation causes the naturally vigorous condition of the tissues of the air-passages of the nose and throat, which normally have the power of rejecting or destroying dangerous bacteria, to become impaired and the entrance of the organisms which are the cause of bronchial and pulmonary disease is greatly favored.

The part played by human beings in gathering and giving off bacteria in the cars should not be forgotten. According to Thomson and Hewlett¹, the number of bacteria inhaled by a human being under ordinary circumstances may reach many thousands during one hour's tranquil breathing.

¹ Trans. Royal Med. and Chir. Soc., Vol. XXVIII, 1896.

The air expelled is sterile, so long as there is no conversation; but Koeniger,¹ a pupil of C. Fraenkel, has shown that bacteria are freely given off in particles of moisture by persons in the act of speaking, whispering, sneezing or coughing.

Another effect of foul air is to offend the esthetic sense, which is a consideration by no means to be neglected in a sanitary question of this nature. The musty odor of close places is partly accounted for by Billings, Mitchell, and Bergey,² who consider it to be due to volatile, fatty acids, associated with bodily excretions and the products of decomposition contained in the expired air of persons having decayed teeth, foul mouths or certain disorders of the digestive apparatus.

Proof of Insufficiency of Ventilation.—To those who have ridden in the street-cars of New York during rush hours in winter, the fact that they are insufficiently ventilated needs no demonstration. The public, as though familiar with the dictum of De Chaumont³ that the air of enclosed spaces should not be unpleasant to the sense of smell of persons coming from outside air, appreciates that the musty odor noticeable in poorly-ventilated street-cars indicates that there are waste matters in the atmosphere which should have been promptly gotten rid of.

Now, an average adult takes into his lungs 396 cubic inches of air per minute and gives off the same amount of vitiated air, which must be greatly diluted before it is suitable for further respiration. The measure of this necessary dilution is very easily understood; for we know that, while fresh air contains about three parts of carbonic acid and air which has passed through the lungs 441 parts of carbonic acid per ten thousand volumes, the air of enclosed spaces becomes close when the carbonic acid exceeds about five parts per ten thousand. From these data it is found that something like fifty cubic feet of fresh air should be admitted to each car every minute per person.

It is clear that no such allowance of fresh air is supplied to passengers on any line of closed cars in Greater New York when they are running beyond their seating capacity. Such ventilation as occurs takes place irregularly by the opening and closing of the doors for the entrance or exit of passengers, or through primitive transoms and not by carefully-regulated ventilators. The writer has found the air of these cars to contain as much as 26.2 parts of carbonic acid gas, as determined by the Pittenkoffer method. Repeated counts of trolley-cars in New York in cold weather have shown that about sixty per cent. had all their transoms closed. The insufficient warming of street-cars in winter accounts, in part, for the attempt made to keep them entirely shut up. Want of a sufficiency of warmth is a prevalent source of complaint and a danger to health, especially in the cars of Brooklyn.

Ventilation on the elevated roads is generally inferior to that on the surface lines, because of the greater size of the cars and smaller proportion of time during which the doors are opened and the people are stirring about.

Carbonic acid gas in the cars of the elevated road has been found by the writer to run as high as 31.2 parts.

The use of coal as a motive power, with the consequent gases, moisture and steam, adds considerably to the discomfort of passengers and makes the condition of the enclosed air especially unsatisfactory.

Bacterial Condition of the Air of Cars.—We have remarked how the street-cars of New York are at times greatly overcrowded and have noted how overcrowding reduces the natural resistance of the body toward disease. It remains to show that specific sources of disease probably occur to a very considerable extent in the air of these overcrowded public conveyances.

That many species of bacteria exist in the street atmosphere of New York has been frequently demonstrated by analysis, the quantitative work of Firth⁴ and the isolation experiments of Dyar⁵ being fair examples of such proof. The fact that pathogenic germs exist in the street-cars has been scientifically proved by Hance.⁶

The elevated railroad cars are in some respects more insanitary than the surface cars. Examinations of the cocoa mats used on the floors of the cars of the elevated railroad have shown that fibers one and a half inches long may hold three or four million bacteria.

But there is no need of extending these data. Only straws of such evidence are necessary to show that the floors and air of street-cars become polluted with dangerous bacteria.

The origin of many of the disease germs which occur in our street-cars can be understood by anybody who has noticed the universal and disgusting habit of spitting. The Board of Health some time ago caused conspicuous notices to be posted, warning the public that spitting in the cars is a misdemeanor punishable with imprisonment and fine, but this order has become a dead letter. The steps and platforms of elevated railroad stations, with their disgusting accumulations of sand, and the cocoa mats of the elevated roads and the gratings on the floors of the surface cars are favorite places for those who indulge in this dangerous habit.

The findings of bacteriology leave no doubt as to the fate of a large part of the expectorated matter. It becomes dry and is pulverized under foot and is finally distributed through the air with dust. How far the spitting habit common in street-cars is responsible for the eight thousand deaths from consumption of the lungs which occur in New York every year can safely be left to the reader's imagination.

Tuberculosis is not the only disease which is probably communicated in the street-cars. From

¹ Zeit. für Hyg. V. ² J. S. Billings, S. Weir Mitchell and D. H. Bergey, Smithsonian Reports, July, 1895, page 150. ³ De Chaumont, Proceedings of the Royal Society of London, Vol. 18, 1870.

⁴ Studies from Dept. Path. College F. & S., N. Y., Vol. VII. ⁵ Am. Annals N. Y. Academy of Sciences, Vol. VIII, May, 1895. ⁶ N. Y. Med. Record, Feb. 13, 1897.

the facts at present known concerning the etiology of other infectious diseases, it can hardly be doubted that the infective poisons of scarlet fever, measles, influenza, diphtheria and pneumonia, not to say smallpox, are spread from person to person through the impure air and close personal contact which occur in the cars.

Conditions in Tunnels and Subways.—New York is soon to see a remarkable development of its railway-passenger traffic underground. It is expected that in two years a rapid transit service twenty-one miles long will be in operation under the streets of the city. The New York Central Railroad, which already operates several miles of subway, is to build extensive additions underground at and near its Forty-second Street Terminal; the Pennsylvania and Long Island Railroads are to connect on Manhattan Island near Thirty-fourth Street by a road built under the city and under the North and East Rivers, and other almost equally extensive projects for underground transit have been announced.

None of the plans for these subway roads, so far as made public, indicates that any special arrangements will be made for the permanent avoidance of the sanitary evils to which attention is here invited. In view of this fact, it may not be undesirable to inquire whether these dangers are likely to be especially prominent in the underground traffic and whether any additional risks are to be looked for in this form of city transportation.

From what is known to the writer at the present time, the greatest dangers to be apprehended on the underground roads are those of over-crowding, want of proper ventilation, and bacterial cleanliness.

Concerning the ventilation of cars, what has been said with respect to the surface lines and their needs will apply to the cars which will run in the subways, with this difference: the subway cars will be enclosures within an enclosure and consequently more difficult to ventilate.

In respect to ventilation outside of the cars, it is significant to note that the air of but few of the many tunnels so far built in various parts of the world is satisfactory. The Mont Cenis tunnel, the Hoosac tunnel, the underground roads of Paris, Liverpool, Glasgow and Boston, and the St. Louis and Baltimore tunnels are all imperfectly ventilated, if they are to be judged from a critical hygienic standpoint. The air in some of these tunnels is almost insufferable; men have been fairly suffocated in some of them, and a ride in the best is not infrequently attended by at least uncomfortable consequences.

It appears that there are no satisfactory methods of ventilating tunnels without great expense. Mechanical fans supplying or exhausting air and the use of blow-holes, shafts or openings, through which air-currents caused by the passing trains are supposed to circulate, have been tried and found inadequate to insure that freedom from objectional waste products which is the end aimed at in ventilation.

Failures in ventilating tunnels are usually due

to a fancied necessity of operating them in the most economical manner possible. Practically the only reliable method of ventilating them requires the use of mechanical fans, and the operation of these involves a continuous and considerable expense. There have been those who have thought that the piston action of moving cars was sufficient to secure a sufficient interchange of air; that foul gasses, being warmer than the rest of the atmosphere, would readily escape if vertical shafts were provided to carry them off; that the currents produced by the rapid passage of trains would cause the foul air to rush up and fresh air down, through blow-holes, and that large stations or occasional openings would afford suitable outlets for the escape of undesirable gases. Unfortunately, experience has shown that too much reliance has been placed upon these cheap and easy methods and that, in the ventilation of large and important tunnels at least, they are not based upon a correct interpretation of physics or sanitation.

Aside from the use of fans, the most beneficial results have followed the opening up of large portions of the tunnel roof to the outside air. But this is not so much solving the problem of tunnel ventilation as it is escaping it. In proportion as a tunnel loses its covering it becomes an open cut.

It is interesting to note the ventilating arrangements of some well-known tunnels.

At Paris an attempt is made to ventilate the underground road of the Chemin de Fer de Seaux by exhausting the impure air with fans at the highest point of the line, fresh air being allowed to enter at the stations and through shafts. Blow-holes are located from 200 to 300 feet apart.

At Liverpool, the tunnel under the Mersey, 1.2 miles long, is provided with a ventilating equipment consisting of a 7-foot ventilating conduit alongside of the tunnel and provided with fans. Openings communicate between the tunnel and conduit at intervals. Foul air is forced out through this conduit and fresh enters at the ends of the tunnel. Analysis has shown that the carbonic acid in the air of the Mersey tunnel varies from 7.4 to 26.4 per 10,000 volumes.

The air in the subway of the Metropolitan Railway of London has long been a source of complaint. A Government commission in 1897 found that the carbonic acid ran as high as 89.4 parts per 10,000. It was recommended that the tunnel be opened as far as practicable by removing portions of its roof.

It is interesting to note that a conclusion similar to that reached by these English investigators was recently arrived at by the Pennsylvania Railroad and the city of Philadelphia in connection with the work of depressing the tracks of the Pennsylvania road in that city. After devising an elaborate system of fans, conduits and stacks to secure a change of air every five minutes, this plan was rejected for a system of large street openings and a natural circulation of air.

Perhaps the conditions presented by the Boston

subway resemble more closely those which may be expected on the rapid transit road in New York than could be found elsewhere. Fifty million people use the subway every year. There are about five miles of track. The entrances and large stations afford conditions favorable to the interchange of air. There is a ventilating equipment consisting of fans 7 to 8 feet in diameter, placed at intervals of from 500 to 1,500 feet. The air in the Boston subway was tested by Prof. Carmichael and found to contain from 6.53 to 9.45 parts of carbonic acid per 10,000 volumes of air. In a car with open ventilators and about sixty-five passengers the carbonic acid gas was 24.97 parts per 10,000. On the street at this time the carbonic acid was 4.5 to 5.9. It is true that the motive power used on most underground roads furnishes the chief cause of complaint and that the annoyance caused by the gases, steam, smoke and cinders given off by locomotives could be avoided by the use of electric traction. But have we any assurance that no coal will be used on the underground railroads of New York? We have seen the tolerance of the public for this nuisance in times past. Locomotives burning coal have been running on the elevated roads and in New York Central tunnel through the heart of the city for many years and in the plans of the future subways the public has not been given assurance that the use of coal will be prohibited.

Disagreeable and unfavorable to health as the gases and solid matters given off by coal are known to be, the chief sanitary danger of cars under ground is the same as the chief danger of cars on the surface and cars overhead. The bacteria of disease are the objects against which the most unceasing warfare should be waged. In so far as the subways, with their openings for stations or ventilation, will be permitted to act as collecting-places for dust and disease germs, transit underground will be dangerous to health.

Conclusion.—The foregoing remarks indicate the nature and extent of what is possibly the greatest danger to which the people of New York are exposed in traveling by street-cars. Under present circumstances, thousands of exhausted and fagged men and women seek the trolley and elevated roads every night and there fight for an hour or so for a place to stand while being transported from their business places to their homes. In the morning they repeat the experience. The foul atmosphere and inadequate warmth of the cars in winter predispose them to disease, and the unclean habits of a dangerous minority of the passengers sow bacterial poisons in the air. Insufficient heating and ventilation are prominent dangers also.

Is there any remedy for the sanitary evils of New York street-cars? There are several. In the first place, the power of the community to make laws for public safety should be utilized and for this purpose it is needful that the necessity for such ordinances should be appreciated. Evidently, the call for decency and

sanitary safety which has thus far been made by the Board of Health has not been heeded, and it is consequently incumbent upon every person who appreciates the importance of this subject to give it emphasis.

The principal objects toward which, as the writer believes, laws intended to improve the sanitary condition of street-cars in New York should be directed are a reduction of overcrowding, the prevention of spitting, and the proper ventilation and warming of the cars. If overcrowding can be prevented, the problems of ventilation and warming can be properly solved, but not otherwise.

The remedies available for overcrowding lie in providing more cars to carry the people and in restricting the number of passengers carried per car. It is not possible to discuss this problem within present restrictive limits, but it may be said that a judicious application of both remedies is the solution to which the writer's study of this problem points.

The rapid transit road, now building, will relieve the congestion to some extent and most of the present lines can be made to handle many more cars than are now employed. If it were made unlawful for the companies to carry more passengers than they could accommodate with sanitary safety, there is little doubt that superior facilities for transporting the public in a decent and convenient manner would be forthcoming.

The prevention of spitting is the subject of greatest consequence in the sanitary improvement of street-cars. Until time develops a popular sentiment which will recognize expectoration to be a moral as well as a legal crime, the most practical remedy for the nuisance seems to be to hold the transportation companies accountable for the condition of the cars. That the companies would be able to attend to this matter without undue hardship is evidenced by the fact that various rules for the safety of passengers are already enforced on the street-cars of the city; for example, passengers are not allowed to ride on the steps of open cars in the summer and generally not on front platforms at any time.

As regards the sanitary aspects of the contemplated railroad subways not included in the rapid transit system, it would be premature to offer any criticism. The resources available for protecting public health under such conditions are sufficient to make these underground steam railroads inoffensive and sanitary. How far these resources of sanitation will be utilized depends largely upon how serious a view the public takes of its own safety.

TABLE, SHOWING CARBONIC ACID IN THE AIR OF SOME TUNNELS AND STREET-CARS. RESULTS STATED IN PARTS PER 10,000 VOLUMES.

Mont Cenis Tunnel.....	107.0
Mersey Tunnel.....	7.4—26.4
Severn Tunnel.....	4.2—11.4
Liverpool Overhead Electric Railway Tunnel.....	12.9
South London Electric Railway Tunnel.....	8.4—10.8
Metropolitan Railway Tunnel, max.....	89.4
Boston Subway.....	6.53—9.45
Electric Car in Boston Subway.....	24.97
Steam Car on Elevated Railway, New York.....	1.8—31.2
Electric Surface Car, New York.....	6.1—26.2

GENERAL ANESTHESIA IN THE PLETHORIC.

BY M. L. MADURO, M.D.,
OF NEW YORK.

THERE are certain phenomena attending the administration of an anesthetic to plethoric individuals that cause considerable anxiety. Chief among these symptoms are duskiness of the features which makes one fear that too much of the narcotic is being given, when in fact not enough is being administered. These cases impress on one the falsity of the idea that a certain method should be employed in anesthetizing in all cases. Experience shows only too well that such is not the case, that the general physique is deserving of some consideration, and that there are types as well as individuals demonstrating new lessons in the art of producing narcosis.

In plethoric persons respiration is likely to become embarrassed, very naturally when it is borne in mind that the upper air-passages become so engorged as to lessen the capacity of these parts. This occurs in normal subjects and is to some extent due to the effect of the anesthetic *per se*. How are we to deal with such cases? The answer naturally suggests itself: Give little anesthetic and plenty of air. And what is the result? Your patient "comes right out." Push the ether, if that is the anesthetic of selection, and the duskiness returns and no end of trouble is caused. It has been my experience that a combination of anesthetics fits these cases admirably. Plethoric individuals take nitrous oxide very well, but ether rather poorly unless you allow them to switch off to chloroform for a while, when on resuming ether they will bear that without discomfort. Hence it has been my habit to administer the narcotics in this order: Immediately after the nitrous oxide, give a few whiffs of ether, then give chloroform for an average of ten minutes, continuing with ether graded with a small amount of air for the rest of the operation. It is to be remarked that no harm can come from such frequent change of narcotics.

Reasons for the sudden transition are apparent when it is noted that spasm of the respiratory muscles during ether narcosis in the plethoric suspends thoracic movement, causing diminished blood oxygenation, and leads to a retardation of the pulmonary circulation and consequently to an overdistended state of the right heart. Chloroform relieves that distention, induces deeper and quieter breathing and causes the pulse to become full and regular in character. This action is only temporary, however, for chloroform continued for any length of time in these cases will be found to be depressing to the heart's action, and the reverse of the order of symptoms found at the beginning of its use will supervene. On the other hand ether, readministered at this stage, steadies the pulse, and if carefully handled will result in the continuance of deep, quiet breathing instituted by the chloroform. The question may be asked, Why not begin with chloroform? Because the latter is especially de-

pressing to the plethoric when used in this way, and gas is well tolerated, is safer and quicker. In hospitals it is not an uncommon thing to see anesthetized patients appear dusky all through the operation and literally "soaked" with ether to be kept under its influence. Investigation will very often prove such patients to be of the plethoric type. At other times it will be noted that some patients take ether very poorly and that all will immediately go well when chloroform is substituted. Conclusions have been formed from these observations which convince me that the method of administering the combination of narcotics, one at a time, is the best, safest and most satisfactory in plethoric subjects.

Pharyngeal stertor is a condition sometimes found in the plethoric and is due to the tongue touching the pharynx. It is apt to cause alarm if one has not heard it before. It is easily overcome by pulling the jaw forward and should give no concern. In like manner the occasional inaudible breathing under chloroform will give some anxiety, but is readily corrected by pulling the jaw backward. Occasionally it happens that the plethoric subject will show a depressing effect on the circulation independent of the change of anesthetic, and certain circumstances under which the heart's action may become enfeebled are usually found responsible. Hemorrhage may be cited as one cause. This, as will be readily understood, should be quickly controlled. Vomiting, due to a light anesthesia or to the choking resulting from a collection of mucus, will cause cardiac depression. One should be certain of a deep narcosis before beginning the operation and very watchful of maintaining it all through. The mouth should be drained by maintaining the proper position and should also be swabbed. The position of the head will sometimes influence a freer air-way. Curiously enough some short-necked individuals breathe more easily if the head be slightly raised by a hard pillow; the majority fare better with the head low and well extended. Again the plethoric usually gain considerable respiratory comfort with the head turned to one side. Such freedom is accounted for by the fact that the tongue falls to the side of the air-passage, and mucus drains more readily from the mouth.

Another important factor in causing circulatory failure is fear on the part of the patient. Many plethoric subjects will come to the operating-table assured that they will not be able to stand the anesthetic on account of difficulty in breathing. That difficulty is naturally exaggerated when excessive apprehension stimulates it. It is very important here to assure the patient that deep and regular breathing will insure a good result. The narcotic to be used should abolish consciousness quickly and should be followed up by the one that is the greatest cardiac stimulant. Such a combination is to be found in nitrous oxide and ether. Opium is used now and then in these cases, usually to the detriment of the patient. The use of morphine, gr. $\frac{1}{4}$.

half an hour before operation, is undoubtedly useful sometimes, but only in selected cases and for some special reason. It would be rational to suppose that when there is respiratory difficulty morphine could counteract it, but such a supposition has not been borne out by experience, inasmuch as after its use cyanosis will take place accompanied by swallowing movements and a decidedly alarming type of breathing—the too quiet, inaudible kind, coupled with the inability of the patient to rouse. These symptoms are all danger signals and should warn us to make full inquiries concerning the use of any opiates previous to the operation.

In conclusion it should be stated that the object of this paper is to prove that there are dangers connected with the administration of anesthetics in the plethoric which can usually be overcome through these hints, enabling one and all to experience satisfaction in selecting the most suitable narcotic.

A NEW METHOD OF APPROXIMATELY ESTIMATING THE NUMBER OF BLOOD-CORPUSCLES FROM STAINED SPECIMENS.

BY MAX EINHORN, M.D.,

OF NEW YORK;

PROFESSOR OF MEDICINE, N. Y. POST-GRADUATE MEDICAL SCHOOL,

AND

GEORGE L. LAPORTE, M.D.,

OF NEW YORK;

INSTRUCTOR IN CLINICAL MEDICINE, N. Y. POST-GRADUATE MEDICAL SCHOOL.

BLOOD-EXAMINATIONS have of late attained great significance in the clinical pathology of most diseases. Especially in internal medicine the result of a blood-examination often has a great influence upon diagnosis. Frequently it is impossible to make accurate counts of the red and white blood-cells at the bedside of the patient; whereas it is always easy to spread some cover-slips which may be examined later. It therefore appeared of value to devise some method by means of which it would be possible to estimate approximately the absolute number of the red and white blood-cells from stained blood-specimens.

Several years ago one¹ of us showed that it is possible to determine the relative number of white to red blood-cells and partially also the absolute number of white cells in such specimens. We have now proceeded to make in a certain number of patients, first, accurate blood-counts according to the usual method, and, second, to count in a certain number of fields of the stained specimens the absolute number of red and white blood-cells and then to compare the results with one another.

The first attempt to count the blood-corpuses was made by Vierordt² and is also based upon counting the blood-cells in a dried state. Vierordt took an accurately measured minute quantity of blood and spread it out on a slide in such a

manner that each corpuscle was isolated and lying in one plane, so that the focus of the microscope did not have to be altered in order to count all corpuscular elements contained in this quantity of blood. For this purpose he drew into a capillary tube of known diameter a minimum of blood, measured the length of the blood column under the microscope and calculated its volume. The blood was then emptied into a drop of a solution of albumin or gum, which was spread out on a slide into a smear three or four inches in length in order to facilitate the count. Then the specimen was dried, a fine glass micrometer ruled in squares was projected over it, each square was counted and the number of blood-cells calculated from these figures. This method necessitated the counting of some 18,000 blood-corpuses, and usually required from three to four hours.

This being a very tedious and for clinical purposes rather cumbersome method, Welcker,³ instead of measuring the blood column each time, conceived the idea of drawing the blood at once into previously graduated pipettes and then diluting it with a 10-per-cent. sodium chloride solution.

"Then the blood is dried on a cover-glass which is placed face downward upon a micrometer, ruled in numbered squares, and is then counted."

From these earlier attempts the various later methods of diluting the blood by means of some fluid and subsequent counting of the blood-elements in a counting-chamber of known capacity have developed. Among these the method most used is that of Thoma-Zeiss.

In his inaugural dissertation* Einhorn says that for the purpose of determining the absolute increase or diminution of the leucocytes or lymphocytes he divided the sum total of the white cells counted in each case by the number of microscopical fields, thus establishing for each case an average for each field. In this manner leucocytosis could at once be recognized by the fact that the average number of leucocytes per field was increased.

Anybody who is experienced in blood-examinations will in a certain given case be able by studying the stained specimen to say that the red or the white cells are diminished or increased. This, however, applies only to marked cases and even then it would probably be quite difficult to estimate even approximately the number of red or white cells, as found by a direct count.

It is a well-known fact that, given the absolute number of red cells as determined by the Thoma-Zeiss counter, we can from the proportion of white to red cells in the stained specimens estimate the absolute number of leucocytes. Strange to say, however, nobody has as yet attempted to estimate the absolute number of corpuscles from the cover-glass specimens directly, without the absolute number of either the erythrocytes or leucocytes being given.

The purpose of this paper has been to com-

*Loc. cit., p. 12.

pare the results obtained by means of the usual Thoma-Zeiss count with those determined from an examination of the cover-glass specimen. If it could be shown that these figures coincide more or less closely and without too great variation, then these counts from dry specimens could be utilized.

We proceeded as follows: In each case the blood under the necessary precautions was first drawn into the red and white pipettes of the Thoma-Zeiss apparatus. Then cover-glass spreads were immediately made according to Ehrlich.⁴ Finally a hemoglobin estimation by Gower's apparatus was added. The number of red and white cells respectively was then carefully determined by the Thoma-Zeiss counter.

In making the cover-slip specimens, we must observe that under no condition ought pressure to be exerted to force the blood from the puncture, but that it must flow out freely just as it should for use in the mixing pipettes of the Thoma-Zeiss apparatus. All precautions essential to a good spread as given by Ehrlich should be scrupulously observed, in order to obtain a uniformly thin distribution of the blood between the cover-slips, *viz.*, very thin, carefully cleansed cover-glasses, not too large a drop, etc. In the same manner the blood must spread out evenly between the cover-glasses by means of capillarity without the exertion of any pressure. If all these necessary precautions are taken, specimens suitable for our subsequent examination are obtained.

smaller, will vary correspondingly, we decided to count all the red as well as all the white corpuscles in a certain square area of the dry specimen and to compare the results thus obtained with those of the Thoma-Zeiss counter. As the unit of the square area counted we have taken a square millimeter. The number of red and white corpuscles contained in a square millimeter is calculated from the fields counted and this result is then compared with the number of blood-cells contained in one cubic millimeter as determined by the Thoma-Zeiss apparatus.

For making this determination we have found a medium power dry objective (DD or E of Zeiss or 5, 6 or 7 of Leitz) with a weaker and a stronger eyepiece most practical. We used objective DD and eyepieces 2 and 4 of Zeiss. With objective DD and eyepiece 2 the whole visual field comprised 0.23 square millimeters. The field area can easily be determined for each objective and eyepiece according to the well known algebraic formula, which makes the square area of a circle equal to πR^2 where $\pi = 3.1415$ and R = radius of circle. The radius of the visual field is determined by means of a fine stage micrometer or the divisions in the Thoma-Zeiss counting chamber, or, given the magnification, by measuring the apparent size of the field at 250 millimeters visual distance and dividing the number thus obtained by the magnification. In the following table we have calculated the area of the field of the various lens combinations most commonly used:

TABLE A.
AREA OF FIELD OF VARIOUS LENS COMBINATIONS MOST COMMONLY USED.

ZEISS.			LEITZ.		
Objective.	Eyepiece 2.	Eyepiece 4 with blood-counting diaphragm.*	Objective.	Eyepiece 1.	Eyepiece 4 with blood-counting diaphragm.*
DD.....	0.23 sq. mm.	0.0113 sq. mm.	5.....	0.26 sq. mm.	0.01 sq. mm.
E.....	0.09 sq. mm.	0.0045 sq. mm.	6.....	0.16 sq. mm.	0.0064 sq. mm.
1/12 Oil.....	0.05 sq. mm.	0.0025 sq. mm.	7.....	0.075 sq. mm.	0.003 sq. mm.
			1/12 Oil.....	0.028 sq. mm.	0.0011 sq. mm.

* NOTE.—The square area here refers, of course, to the field embraced by the square opening in the blood-counting diaphragm.

Preparations made by spreading the blood on a slide by means of a spreader or by allowing the blood to spread out by force of capillarity (according to Hayem) between two superposed cover-glasses held in forceps, are not suited to our purpose on account of the uneven distribution of the blood-corpuscles.

All our specimens were without further fixation immediately stained for two minutes by means of Jenner's stain,⁵ which is really a universal one in that it brings out beautifully all the various granulations from eosinophiles to the granules of the mastzellen, which stain in a deeply metachromatic fashion. The neutrophiles and malarial parasites show up especially well.

Our method of examination was as follows: Starting from the supposition that in carefully prepared specimens the distribution of the blood elements, according as their number is larger or

Objective DD and eyepiece 2 we used only to count the leucocytes in the whole field. As it would be impossible to count also the more numerous red cells in so large a field, we contented ourselves by counting only a certain known fraction of the whole field. For this purpose we used the same objective DD but with eyepiece 4, into which, for the sake of still further reducing the field, we inserted a diaphragm with a square opening. This diaphragm is provided with a small handle and by means of the latter can be easily placed upon the circular diaphragm in the eyepiece. This small apparatus consists of a round metal plate in the middle of which there is an opening 3 millimeters square, which again is subdivided by means of two fine crossed platinum hair wires into four smaller squares. (See Fig. 1.) The square area of this whole aperture is only about $1/20$ that embraced by objective DD

and eyepiece 2. We might perhaps give to this contrivance the name "blood-counting diaphragm."*



Fig. 1. Blood-counting Diaphragm.

After making these calculations we can proceed to the actual count. First with a low objective (AA Zeiss or No. 3 Leitz) we look for a place

again. This is repeated until we have counted an area sufficiently large to give reliable data. Generally speaking we found that counting about 6 square millimeters, corresponding to about 25 fields, was in most cases sufficient to insure accurate results. Having thus calculated the number of erythrocytes and leucocytes contained in one square millimeter, we divided the result thus obtained into the number of blood-cells contained in one cubic millimeter, as determined by the Thoma-Zeiss method. According to our considerations and premises the result of this division must be a constant factor.

We have laid down the results of our examinations in the following table:

TABLE B.

Number.	Name.	Hemoglobin, per cent.	Thoma-Zeiss count.		Number of blood cells in 1 sq. mm. of cover-glass specimen.		Factor.*	Number of blood corpuscles in 1 cu. mm. as calculated from stained specimen.**		Remarks.	
			Red.	White.	Red.	White.		Red.	White.		
1	R.	23	2,670,000	12,800	4,811	34.3	555	373	2,405,500	13,730	
2	B. K.	68	4,850,000	152,000	9,820	388	494	391	4,910,000	155,200	
3	H. E. J.	80	4,710,000	8,300	8,689	18.6	543	445	4,344,500	7,440	
4	H.	50	3,970,000	6,400	7,424	17	534	376	3,712,000	6,800	
5	T.	82	4,850,000	9,000	8,840	26.3	548	365	4,420,000	10,580	
6	H. G.	41	3,780,000	28,500	7,904	69.3	470	411	3,952,000	27,790	
7	B. F.	70	5,900,000	6,600	11,800	15.9	440	415	5,000,000	6,360	
8	T. G. W.	77	5,650,000	8,500	11,310	22	499	386	5,655,000	8,860	
9	S.	72	5,450,000	14,900	10,140	34	538	438	5,070,000	13,600	
10	L. M.	65	4,460,000	23,300	9,034	50	493	414	4,517,000	22,400	
11	B. R.	75	4,850,000	8,900	10,143	20.5	476	434	5,071,500	8,200	
12	H. F.	50	4,633,000	11,200	8,854	26.5	523	493	4,427,000	10,600	
13	C. di M.	78	5,480,000	9,066	10,050	22	545	411	5,025,000	8,800	
14	J. W.	75	4,450,000	11,000	8,448	29.3	527	375	4,224,000	11,720	
15	L. D.	65	5,005,000	8,080	9,973	18.0	507	436	4,986,500	7,440	
16	A. C. M.	85	5,837,000	7,800	11,843	19	493	410	5,921,500	7,000	
17	M. K.	85	4,900,000	9,500	9,878	25	496	284	4,929,000	10,000	
18	L. M. C.	98	5,050,000	7,800	10,700	19.6	473	367	5,350,000	7,840	
19	M. C.	78	4,320,000	6,400	8,168	15.3	528	418	4,084,000	6,120	
20	H. N.	70	4,900,000	17,000	10,520	45	465	377	5,260,000	18,000	
21	N. A.	32	3,965,000	9,730	8,118	28.1	488	345	4,059,000	11,240	
22	M. G.	35	3,757,000	11,700	7,697	30.3	488	366	3,843,500	12,120	
23	M. C.	90	5,050,000	9,400	11,800	25.4	478	370	5,000,000	10,160	
24	P.	87	4,850,000	8,000	9,836	19	493	421	4,918,000	7,600	
25	G. W.	25	2,091,000	3,800	2,206	9.5	495	400	1,103,000	3,800	Pernicious anemia.
26	G. W.	30	2,900,000	4,400	3,608	10.6	506	415	1,804,000	4,240	Same patient one week later.
Average factor.....						504.4	399.4				
Average factor in round numbers						500	400				

* This factor is calculated by dividing the number of corpuscles in one cubic millimeter, according to Thoma-Zeiss, by the number of corpuscles found in one square millimeter of the stained specimen.

** The number of blood corpuscles in one cubic millimeter as determined from a count of the cover-glass preparation was found by multiplying the number of red or white blood cells respectively found in one square millimeter of the specimen by their respective average factors (90 for the red, 400 for the white cells).

in the stained specimen where the corpuscles appear thin and evenly spread. Places where the red blood-corpuscles do not lie singly but are superposed upon one another, or where large empty spaces are visible in the field, are unsuitable for our purpose. Having found a good place, we use objective DD and eyepiece 2. With this we count all the leucocytes visible in the field. Without moving the specimen we now exchange eyepiece 2 for eyepiece 4, into which we have previously placed our blood-counting diaphragm. We now count all the red cells visible in the whole square aperture or in one or two of the smaller squares. Then we reinsert eyepiece 2 and move the specimen by one field and count

On looking over the table we find that the final results of the counts made with the Thoma-Zeiss apparatus and of those made from the cover-glass specimen do not materially differ. In the counts of the red as well as of the white cells, figures differing by 10 per cent. or more are found twice only in each column, being 11 per cent. and 12 per cent. respectively for the red and 11 per cent. and 13.5 per cent. respectively for the white cells. The differences of all the other calculations lie below 10 per cent. and we see from the table that the total average difference is 4.8 per cent. for the red and 5.8 per cent. for the white. If one takes into consideration that the average error, even in most skilful hands, of the Thoma-Zeiss method is also about 2 per cent., we must grant that the method of counting from the stained preparation is for clinical purposes perfectly satisfactory and sufficiently accurate.

* This diaphragm may, of course, also be employed for counting the leucocytes, when they are very numerous, as in leucemia. The blood-counting diaphragm is manufactured by Eimer & Amend, corner Eighteenth Street and Third Avenue, New York.

In further considering the table it strikes us that the factor for the white is uniformly $\frac{1}{5}$ smaller than that for the red. At first sight this appears strange, as we would expect that the relation of the number of red and white blood-cells found in one square millimeter to that found in one cubic millimeter would be the same for both kinds of corpuscles. If, however, we consider that the white cells on an average are considerably larger in diameter than the red, and that the latter determine the thickness of the stained specimen, the factor for the white cells must be smaller, as a single layer of white corpuscles is thicker than one of red cells.

The amount of hemoglobin seems to have no influence upon the resulting factor.

As the factors are all pretty nearly alike it seems justifiable to strike an average. This was done first by taking an average from all the factors of the red and white cells separately and also by taking the average of 3 highest and 3 lowest factors determined. In both cases, the result being about the same, we obtained in round numbers an average factor of 500 for the red and 400 for the white. These figures are easily remembered and facilitate calculations.

Our method of estimating the corpuscles would according to what has just been said be about as follows:

After preparing the cover-glass specimen and selecting a suitable area, as described above, we count with objective DD and eyepiece 2 all leucocytes visible in the field. After changing eyepiece 2 for eyepiece 4, into which we have placed our blood-counting diaphragm, all the erythrocytes visible in the entire square aperture or some part of it are counted, without having moved the specimen. Now we reinsert eyepiece 2 and move the slide for the width of one field. This procedure is repeated until about six square millimeters (25 fields) have been counted. From these figures the number of leucocytes and erythrocytes in one square millimeter of the cover-glass specimen is calculated. The number of leucocytes in one square millimeter is found by simply dividing their total number counted by the number of square millimeters counted. With the red we proceed in the same manner except that we have to multiply the resulting quotient by the number which indicates how many times the field of eyepiece 2 is larger than that of the field embraced by the square aperture of the blood-counting diaphragm in eyepiece 4. In our case this number was 20.3. All we have to do now in order to obtain the number of corpuscles in a cubic millimeter is to multiply the numbers counted in one square millimeter by the average factors (500 for the red and 400 for the white cells). Lately we have modified the blood-counting diaphragm by substituting a glass disk for the metal part, leaving the arrangement for the square (3mm.) as before described, the square being formed by lines cut in the glass disk. In this way the blood-counting diaphragm enables us to count the white and the red cells without change of eyepiece.

As an example we will take the following case: In six square millimeters of the stained specimen we have counted 416 leucocytes; in the same six square millimeters the number of red cells counted with the blood-counting diaphragm was 2,336. There were therefore in one square millimeter $416 \div 6 = 69.3$ white cells. The number of red cells in one square millimeter must be $2336 \times 20.3 \div 6 = 7904$. The number of leucocytes contained in one cubic millimeter is therefore $69.3 \times 400 = 27,720$ and of the erythrocytes $7904 \times 500 = 3,952,000$.

Besides the fact that by means of a cover-glass count we are enabled to estimate the number of corpuscles from blood-specimens, of which we have no other count, our method offers, even when Thoma-Zeiss apparatus is at hand, certain material advantages.

First, the whole procedure is a very simple one. Neither pipettes nor diluting solutions are needed. Every physician can easily carry a few cover-glasses in his pocket and thus always has at hand all the utensils necessary for obtaining a specimen for counting.

Second, the method is a very rapid one. If we wish to determine the number of leucocytes only, we can reach an accurate estimate in five or even three minutes after staining. If besides the white the red cells also have to be counted, which of course is a more tedious procedure, it will take from ten to fifteen minutes. Those who have had experience in blood-counting will grant that an accurate count either of the red or white alone according to the Thoma-Zeiss method will with the necessary subsequent careful cleaning of the pipette take not less than half an hour, usually longer.

This method of cover-glass counting furthermore allows us to obtain simultaneously an idea about the condition of the blood as manifested in the stained specimen. It is easy, especially when counting the leucocytes alone, to combine a differential leucocyte count with it, which also tends to save time.

Finally, by this method we are enabled by reason of its rapidity and simplicity to count more frequently, from hour to hour if necessary. No one will doubt that this may occasionally be of great diagnostic and prognostic value in cases of acute appendicitis or similar acute cases in which pus may be suspected and in which we have to deal with a persistent or progressive hyperleucocytosis.

Curschmann⁸ has again lately shown the importance and the great diagnostic value of repeated leucocyte-counts in acute appendicitis. In a similar manner, when we suspect internal hemorrhage (in extra-uterine pregnancy, etc.), frequent hourly or even half-hourly counts may perhaps give us valuable hints.

It is evident therefore that in counting from the stained specimen we possess a method that is at once simple, rapid and sufficiently accurate and therefore should recommend itself for clinical purposes.

BIBLIOGRAPHY.

¹Max Einhorn: Ueber das Verhalten der Lymphoeyten zu den Blutkörperchen. *Inauguraldissertation*, Berlin, 1884.

²Wierordt: Neue Methode der quantitativen mikroskopischen Analyse des Blutes. *Archiv für physiolog. Heilkunde*, B. XI., 1882, Heft 1.

³Weicker: Ueber Blutkörperchenzählung (Arch. d. Vereins für gesellschaftliche Arbeiten, B. I., p. 161, 1883). *Jahresbericht* 1883, p. 29.

⁴Marie: Die Anämie (Nothnagel's Handbuch), 1888, p. 370.

⁵Louis Jenner: A New Preparation for Rapidly Fixing and Staining Blood. *Lancet*, Feb., 1897, p. 370. Jenner's stain consists of an alcoholic solution of a neutral (in Ehrlich's sense) precipitated mixture of eosin and methylene blue.

⁶Curschmann: Zur diagnostischen Beurteilung der vom Blutdruck und Wurmfortsatz ausgehenden entzündlichen Prozesse. *Münchener med. Wochenschr.*, 1901, Nos. 48 and 49.

MEDICAL PROGRESS.

SURGERY.

Suture of the Abdominal Wall.—The ideal method of approximation is that of layer-to-layer apposition by independent planes of suture. The ideal suture material is one which can be rendered sterile by boiling in water, that will remain sterile while in the tissues, and that will cease to exist in the tissues when healing is complete. These indications are not fulfilled by absorbable sutures of which catgut is the type, as it is almost impossible to be certain of its sterilization. C. DAVISON (Annals of Surgery, Mch., 1902) presents a new method which he has been using with very satisfactory results for a long time. The wounds are closed by suturing each layer with a continuous silkwormgut suture, the ends of which are left out at the angles of the wound to be removed by traction when healing is complete. This is easy of accomplishment, inasmuch as there is a tract of pressure necrosis around the stitch which renders it a matter of great simplicity. It is convenient for purposes of identification at removal either to color these sutures black with silver nitrate, blue with methylene blue, and so on, or to knot the ends. In general the advantages of this method of suture are as follows: (1) Certainty that all suture or ligature material placed in the wound has been made sterile by boiling in water. (2) Accurate layer approximation of tissue. (3) Removal of the buried sutures when healing is complete. (4) Capillary drainage from each layer. (5) Safety of intestines from injury during the application of the sutures. (6) Rapidity of application. (7) Minimum line of irritation on the peritoneal surface and consequent adhesions to the viscera. (8) Slight scar in the skin, there being no perforation of the skin by sutures. Halsted's subcuticular stitch being invariably used. (9) All of the advantages of a permanent buried suture without the danger of future irritation and extrusion of the knot. (10) The advantages of an absorbable suture without the danger of sepsis from the suture and without producing a nidus for septic germs from the blood-current during absorption. The claim for originality which is advanced is not in the use of a longitudinal suture, but in tightly and securely tying a buried longitudinal suture by the use of simple and ingenious knots, releasable by traction, which admit of easy removal when healing is complete.

Cancer of the Breast.—Carefully compiled results in operative cases are always instructive. A. M. SHIELD (Lancet, Mch. 8, 1902) presents those of sixty cases of cancer of the breast in a paper which will in its entirety reward reading. The conclusions will be of interest to all and are as follows: The risk of removing cancer of the breast by extensive operation is small and should not amount to more than 1 or 2 per cent. Sepsis may occur, but when it does it is a blameworthy error on the part of the surgeon. Early and free removal gives

a prospect of years of freedom and in a good percentage of cases of good health and enjoyment of life. The cases which do badly are those of soft, rapidly-growing cancer in young, full-blooded women and those long-standing cases in which operation has been postponed until the skin and glands of the neck are widely infected. In a certain number of cases cancer of the internal organs, the liver for example, coexists or rapidly follows the operation and is of unsure, unsatisfactory explanation. The practice of early exploration by incision of small nodules and indurations in the breast is of the first importance and should be strongly urged upon the profession generally, especially upon those in general practice, who so often see these cases in their very beginnings and upon whom the great responsibility of prompt diagnosis falls. No one should undertake an operation for cancer of the breast unless he is capable and has had sufficient operative experience to remove thoroughly all lymphoid tissues from the axilla. The infected glands left in the apex of the axilla are the commonest sources of failure in the results from this operation. The prognosis of mammary cancer is still in doubt and sometimes instances arise which seem to falsify ordinary experience. Bad cases have no freedom from return at times. Early cases may show recurrence, but such exceptions do not invalidate the rule, "operate early, operate extensively."

X-ray Burns.—A study of the cases of accidental Roentgen-ray burns hitherto recorded has led to some interesting conclusions as reported by E. A. CODMAN (Phil. Med. Jour., Mch. 15, 1902). He finds that the frequency of such accidents has been much exaggerated owing to the wide publicity given to early cases. Only about 200 cases could be collected, less than one-half being serious and one-third occurring in X-ray workers. At a maximum estimate it may be said that not one patient in a thousand has been injured by the X-ray during the last five years and in the last year not one in ten thousand. Improved technic probably accounts for the fact that more than two-thirds of these injuries occurred during the first two years of the use of the method. The primary injury is to the nerves controlling the nutrition of the skin and there is no good evidence of involvement of the deeper tissues without primary interference with the skin. The important factors which contribute to the production of X-ray burns are (1) the intensity of the current used to stimulate the tube, (2) the quality of the tube, (3) the distance and time of exposure, and (4) the idiosyncrasy of the patient. The static machine seems less likely to produce injury than do other forms of apparatus. From the data of the reported cases it may be stated that no burn has been produced by an exposure equal to or less than the equivalent of five minutes at ten inches. The intensity of the burn is an inconstant factor which depends rather on the complex human organism than on the less complicated construction of the tube. It has been shown, however, that soft tubes produce a more intense effect on the tissues than do hard tubes. The time of the first appearance of symptoms varies from few minutes to three weeks or later in a few cases. As a standard therapeutic exposure the author suggests ten minutes at six inches from the terminal. The reason that most severe burns are reported on the abdomen or groin is undoubtedly due to the fact that these, being the thickest portions of the body, require the longest exposure. Two main lines of treatment are recommended, though for the most part unsatisfactory: (1) Physiological rest and mild poulticing, and (2) excision followed by skin-grafting, when the former has failed absolutely. As precautions in angiographing the author relies entirely on keeping the distance and time

of exposure within proper limits. In therapeutic exposures the parts to be protected are covered by a lead plate and a grounded aluminum sheet may be used between the patient and the tube.

Tropacocaine in Spinal Anesthesia.—A series of forty-nine operations in which tropacocaine was used is reported by W. P. ILLING (Jour. Amer. Med. Assoc., Mch. 22, 1902), among them being included three laparotomies, three amputations of the leg, one at the thigh, a herniotomy, plastic operations on cervix and perineum, and various minor cases. Although readily sterilized by boiling, the author believes that this reduces its effectiveness about one-half and he prefers heating the solution in an autoclave or hot-water bath at 176° F. for fifteen minutes and then allowing it to cool three hours. This procedure is repeated four or five times. In comparison with cocaine, the recovery from its effects is found to be much more rapid, although its action is slower (about ten minutes). There is usually no complaint of thirst, no heat, vomiting, nor perspiration, no marked effect on the pulse, no dyspnea. Relaxation of the sphincters is sometimes present. The author believes that perfect results can be obtained by the injection of one-sixth of a grain for an anesthesia lasting fifteen minutes. He also precedes the injection by a hypodermic of hyoscine.

Spina Bifida.—A new suggestion for operating in this condition is advanced by L. FREEMAN (Jour. Amer. Med. Assoc., Mch. 22, 1902). He employs fine silver wire for closing the aperture in the vertebral column. After placing the nerve structures and remnants of the sac within the canal, a No. 27 silver wire suture was, in the case reported, passed in continuous fashion from one side of the opening to the other through the periosteum, ligaments, and even through bone, the stitches being sufficiently close together to form a firm covering incapable of displacement. The overlying soft parts were sutured with silkwormgut. The immediate result to date of writing was excellent.

Etiology and Treatment of Pruritus Vulvae.—In connection with studies on the causative factors of this disease, L. SEELIGMAN (Deut. med. Woch., Feb. 27, 1902) has been able to isolate and cultivate a diplococcus from all his cases within the last ten years. It resembles the gonococcus in shape and appearance, but differs in the manner of growth; it takes readily the Gram and the anilin stains. It is quickly killed by a 10-per-cent. guaiacol solution in vasogen, and this application has also given great success clinically. He has cured many primary and secondary cases by means of this remedy applied with a cotton swab on several successive evenings before retiring. If necessary a 15- or 20-per-cent. solution may be used, but is apt to prove irritating.

Carcinoma and Ulcer of the Stomach.—The somewhat frequent association of carcinoma with chronic gastric ulcer should always lead to a two-fold prognosis when an ulcer has been diagnosed. The immediate prognosis refers to the healing of the ulcer and the disappearance of the symptoms and is fairly good; the more remote prognosis considers pyloric stenosis, consecutive dilatations of the stomach, a frequent sequela of carcinoma, and is quite bad. G. FUETTERER (Jour. Amer. Med. Assoc., Mch. 15, 1902), in a review of the literature of this subject and in a study of his own cases, presents the following conclusions: If a carcinoma develops from a chronic ulcer of the stomach, it takes place from those edges which are most exposed to mechanical irritation by the contents of the stomach. It occurs more frequently in the pyloric region, less often in other parts. Gastro-enterostomy should therefore be recommended in all cases in which

an ulcer or a scar narrows the pylorus; this would reduce the irritation by the food current and the severe friction necessary to produce a carcinoma will probably not occur. If gastro-enterostomy be not performed in such a case, the patient should be advised to eat slowly and a little at a time, to avoid hard or coarse food and to confine himself to liquid or semi-liquid foods and fats. In all cases of chlorosis and secondary anemia energetic treatment should be instituted as a prophylaxis against the formation of ulcers.

Double Rachitic Coxa Vara.—To the able classification of this lesion given by De Quervain, in 1898, one can add nothing. It is arranged as follows: (A) Congenital incurving of the neck of the femur. (B) Infantile incurving of the neck of the femur, (1) downward, (2) backward and downward; both are generally rachitic. (C) Adolescent incurving, with similar malpositions. (D) The adult form, which is typically osteomalacic in origin. It will be seen that the chief basis of this classification is one of age. G. GEVAERT (Journal de Chirurgie, Feb., 1902) says that it is not possible to find a case which does not fully fit into one of its subdivisions. In general, however, but two varieties of coxa vara are met with; the infantile, of rachitic origin, and the adolescent, which is accompanied by outward rotation and a diminution of flexion, the male sex being most frequently affected. Before the introduction of radiography, the diagnosis was a matter of considerable doubt; now, however, many cases are recognized which had formerly passed unnoticed. Hoffa writes: "Rachitic coxa vara is not a rare disease, although by no means as frequent as other rachitic deformities of the osseous system. Often one sees more or less elevation of the great trochanter with a marked limitation in abduction. In most cases one finds a diminution in the angle at the neck of the femur; occasionally this may be masked by a curve of the femoral diaphysis. So far as the treatment of the rachitic variety goes, spontaneous recovery is usual in the more moderate forms, as is the case in other rachitic deformities. In the graver cases it is occasionally necessary to have recourse to subtrochanteric osteotomy." The prognosis of coxa vara in the child is good. De Quervain states that since the rachitic dyscrasia ceases at five years of age, it follows that the nearer the infant is to this age the better is the outlook. In the adult, in whom the condition is often osteomalacic, the affection is painful and is apt to be progressive; it calls for immobilization and rest as well as for energetic therapeutic treatment during the painful period. In childhood, on the contrary, there is no pain, the disease is self-limiting, is helped markedly by a sojourn at the seaside and calls for absolutely no local treatment whatsoever.

Preventable Complications of Appendicitis.—The direct complications of appendicitis, resulting from a spreading of the infection, are enumerated by A. J. OCHSNER (Münch. med. Woch., Feb. 25, 1902) as follows: Diffuse peritonitis, circumscribed peritonitis, infection of the tubes, ovaries and gall-bladder, gall-stones, liver-abscess, empyema and the rare infection of other serous membranes, such as the endocardium, the meninges and the synovial membranes, and, lastly, metastatic abscesses in different parts of the body, especially in the liver and parotid gland. To obviate all these, the ideal plan would be to operate within the first thirty-six hours after the onset, but this is often impossible, because the diagnosis is not made sufficiently early and because a surgeon is not always at hand. For those cases that are too late for the early operation and too early for the interval operation, the danger of complications may be considerably minimized by not giving

the patients any food whatsoever per os. The absolute rest which is thus insured for the bowels will permit the omentum to cover the seat of the inflammation and will close the ileocecal valve. When nausea exists, the stomach may be washed out to advantage; small amounts of hot water may be given at frequent intervals, and the strength should be kept up by four-ounce nutritive enemas every four hours. All purges and laxative clysmata are to be avoided.

Etiology of Sinus Thrombosis.—In many cases of injury to the head death follows in a strange and hitherto unexplained manner, as in the case of a patient whose history, given by A. Dorr (Münch. med. Woch., Feb. 25, 1902), states that he fell off a wheel, after which he complained of headache which barely permitted him to follow his vocation. The next day, however, coma, convulsions, rapid pulse and stertorous breathing developed. A provisional diagnosis of uremia or meningitis was made. Death occurred the day after and the autopsy revealed an extensive thrombosis of the cerebral sinuses. Experiments were then conducted on healthy dogs and it was found that by means of severe blows on the head without wounding of the soft parts, fracture of the skull, injury to the sinuses or suppuration, severe and eventually fatal cerebral symptoms could be induced which apparently had as their cause a thrombosis secondary to anatomical changes in the sinus endothelium.

Epiploectomy in Cirrhosis of the Liver with Ascites.—Talma of Utrecht was the first to suggest the establishment of a collateral circulation by means of adhesions between the abdominal viscera and the parietes for the relief of these cases. The first three operations of the twenty-eight cited in a paper by GASTON TORRANCE (Annals of Surgery, March, 1902) were performed in Holland as a result of these suggestions. At that time the operation was based purely upon the supposition that the ascites was due to obstruction of the portal vein by the cirrhotic condition of the liver and that if part of this blood-current could be turned into the systemic circulation the portal pressure would be lowered and the ascites would disappear. Of late, however, another theory has been added to this, that advanced by Rolleston and Turner, who argue that the condition is the result of a toxemia of the blood rather than a mere mechanical obstruction. The toxins are supposed to exert a lymphagogue action. The toxemia is due supposedly to the cirrhotic liver being unable to destroy the poisons which are continually passing to it from the alimentary canal, and these getting into the general circulation cause edema of the legs and ascites. A great deal of interesting experimental work touching on the problems which are as yet unanswered in relation to ascites has been done, notably by Morison and by Packard and LeConte. These observers short-circuited the blood from the portal vein into the inferior vena cava, and the dogs on which this was done were subjected to different kinds of feedings. Very many interesting nervous symptoms were thus elicited, some of the dogs being alternately excited and depressed, others giving purely physical symptoms, such as asthenia and convulsions. No definite conclusion has been reached as yet as to the ultimate cause of the ascites, because in these experiments there was no return of the ascites, albeit the symptoms were in all probability due to toxic material passing into the general circulation. Nor has as yet any light been thrown upon the ultimate cause of hemorrhages from the stomach and bowel in cases of cirrhotic liver. A number of cases of ascites of this type have been cured by repeated tappings. MacDonald reports two cases, one of which recovered after having been tapped sixty times, 9,000 ounces of fluid having been removed. The other case was tapped

thirty-one times, 8,600 ounces of fluid being removed; ultimately the ascites disappeared altogether. Drummond cites a number of cases of cirrhosis of the liver in which there was no ascites. Autopsy revealed extensive adhesions, extremely vascular in nature, between the viscera and parietes. These doubtless accounted for the absence of ascites and have a very important bearing on the prognosis of this new operation. Several of his cases had been cirrhotic for at least twenty years. Sappey gives the following as the normal collateral circulation of the portal system: Veins connecting the portal vein with the phrenic vein and vena azygos major and running subperitoneally between the folds of the hepatic ligament; another large vein running in the round ligament and connecting the left branch of the portal with the epigastric and other veins of the abdomen; the coronary veins communicating freely with both azygos veins through the esophageal plexus and the inferior mesenteric with the internal iliac by means of the middle and inferior hemorrhoidal plexuses. These veins become very much enlarged and in some cases succeed in diverting the blood-current when the portal vein becomes obstructed, but in the majority of cases they do not suffice and this collateral circulation must be increased. This is best accomplished through the omentum. The following conclusions may be summed up from the histories of twenty-eight cases: (1) Ascites due to liver cirrhosis can be cured by the establishment of an efficient anastomotic circulation. (2) Adhesive peritonitis produces adhesions between the abdominal contents and its parietes in which new blood-vessels form. If there be any demand for the new blood-vessels they remain permanently. (3) It is no longer desirable to treat the ascites due to cirrhosis by repeated tappings, if the patient be otherwise sound and in fair general condition. After one or two tappings have failed, operation offers the best chance of prolonged and useful life. Rolleston and Turner hold that the operation benefits the patient by somewhat diminishing the flow of blood through the liver. It may enable that organ to deal more satisfactorily with the blood passing through it and so reduce the toxemic condition of the blood, which is probably the important factor in inducing ascites. The increased vascular supply to the surface of the liver may by improving the nutrition of the hepatic cells enable them to undergo compensatory hyperplasia. This enables the organ more efficiently to perform its antitoxic functions and improves the symptoms. Muscroft and Ingalls say that results under both general and local anesthesia are about equal. Theoretically local anesthesia should be used. Shock is not marked; the patients are usually better after the operation than before it. Early operation should be advised. Frazier says the operation should be done under local anesthesia as the patients are usually alcoholics. Every case of cirrhosis accompanied by ascites is not suitable for operation, as success is absolutely dependent upon the retained functions of the liver cells. There is little doubt that the best results have been obtained by simply suturing the omentum to the parietes. Talma has sutured the gall-bladder also. Others have irritated the spleen and liver surfaces. It seems probable that inasmuch as the operation was designed to relieve the strain on the liver cells, one should attempt to divert as much of the current from the liver as possible. The results of this promising operation are as follows: 42.30 per cent. died, 57.70 per cent. recovered. Of these 38.47 per cent. have been cured; 7.70 per cent. have been improved; 11.53 per cent. have remained as they were.

Treatment of Perityphlitis.—If in any disease, it is in inflammatory processes originating in the vermiform appendix that early medical attendance is of im-

portance, says C. BAUMLER (Deutsch. Arch. f. klin. Med., Vol. 73). The patient generally makes two great mistakes before he sees a physician: (1) He remains active if the pain is not sufficiently severe to demand rest, and (2) he treats his supposed colic with laxatives. Both measures interfere with the processes which prevent spreading of the inflammation; and the laxative, instead of relieving the pain, will increase it and bring on vomiting without the desired stool or else there will be thin stools with, however, an aggravation of the general symptoms. In case the patient has been constipated for several days, even if scybala can be felt in the left iliac fossa, no contraindications to the use of opium or morphine exist if pain demand it and it is only when the tympanites is very marked and when fecal masses are found in the rectum, on digital examination, that from 100 to 150 grams of warm olive oil may be very carefully injected. Intestinal disinfectants possess very little value. The patients must abstain from all food for from twenty-four to forty-eight hours to insure all arrest of peristalsis and even large quantities of water are to be withheld; later on fluids, in small quantity and frequently given, form the appropriate diet. Morphine must be administered in sufficient amount to keep the patient quiet and free from pain; it may be combined with atropine; there is little danger of producing paralysis of the intestines with ordinary doses or of obscuring the picture. Much more satisfactory than all these medical measures would be the early operation before a true perityphlitis has developed, but the patients rarely present themselves sufficiently early and it is difficult to get their consent while the symptoms are still mild. Unquestionably an operation must be urged if a large pus focus be present and the factors which prove its existence are the gradual or sudden increase in size of the tumor, the gradual or sudden increase of pulse and temperature or increase of pulse with fall of temperature or the doughy condition of the subcutaneous tissue, with or without reddening of the skin in the neighborhood of Poupart's ligament. The proper time for operation cannot be measured by the number of days of illness.

Form of the Filled Bladder.—It has been taught for many years that the secretion of the posterior urethra, owing to the compressor urethrae, cannot flow out at the meatus, but gravitates back toward the bladder and that in the filled condition the bladder and posterior urethra formed one pear-shaped cavity, owing to weakness of the internal sphincter. That this is not so has been conclusively proven by M. von ZEISSL and G. HOLZKNECHT (Medizin. Bl., Mch. 6, 1902), who took careful radiographs of the bladders of cadavers filled with metallic mercury. In all cases the bladder was shut off from the urethra at the beginning of its prostatic part and thus gave a globular shadow. The value of these experiments lies in the fact that they point out the fallacies of diagnosing anterior and posterior urethritis by the so-called "two-glass test."

Suprapubic Cystoscopy.—It is well known that cystoscopy through the urethra is often impossible with any degree of success. P. KRASKE (Ctblt. Chir., Feb. 8, 1902) had occasion recently to examine two bladders through a fistula leading above the pubic symphysis. He was surprised to find how good a picture of the organ he obtained and this led him to devise a cystoscope, the peculiarity of which is that its point is arranged like that of an ordinary trocar. His idea is to pass it through the abdominal wall into the bladder at this point and there make his examination. It appears to have the objection that a sharp-pointed instrument is moved about the interior of such a viscus as the bladder. If the procedure be followed at all, it appears to be far wiser to use an ordinary trocar and cannula of

large size, to withdraw the trocar and to make the examination with the cystoscope through the cannula, which could be withdrawn, leaving the margins of the wound to clasp the shank of the cystoscope and prevent the reflux of the water used to dilate the organ.

Floating Kidney as a Cause of Obstructive Jaundice.—Movable kidneys are very frequently felt if examined for and many of them never give any disturbance whatever. Besides the ordinary train of symptoms which accompany a marked case, however, there may be present evidences of hepatic colic with jaundice; upon examination a tumor is palpable opposite the ninth costal cartilage which is mistaken for a dilated gall-bladder. J. HUTCHINSON (Practitioner, February, 1902) reports several instances in which this mistake was made and in which the abnormal condition of the kidney was undoubtedly responsible for the symptoms. An explanation for the cause of this peculiar result is offered by Weisker, who believes that the obstruction to the flow of bile is due to the kinking of the cystic duct by traction exerted by the hepatorenal ligament. Hutchinson was unable to convince himself of this condition and suggests that the intimate relation of the duodenum and the kidney results in pulling down the second portion of the duodenum where the kidney is displaced and hence the gall-duct is drawn out of position and perhaps obstructed. He has seen a few cases in which such a condition was found upon operation, the symptoms entirely disappearing when the kidney was sewn in position.

Gauze Packing in Appendicitis Operations.—It was Mikulicz who concentrated attention upon the idea of obtaining gross cleanliness of peritoneal infected areas and the consensus of surgical opinion was soon in favor of the use of gauze packing for the purpose of keeping the infected surfaces apart. R. T. MORRIS (Med. Rec., Mch. 22, 1902) believes that the presence of gauze packing frequently causes the excessive exudation of lymph which may result in annoying peritoneal adhesions and lifelong discomfort to the patient. The presence of iodoform only adds to the misery and many a patient has died of iodoform-poisoning rather than of septicemia. Furthermore, its use usually leaves a weak point in the abdominal wall inviting the development of ventral hernia. The worst feature of gauze packing, however, is its tendency to do what any foreign body would do in the same place—it depresses the patient's general resistance and prolongs if it does not sometimes cause the condition of shock. The production of phagocytes is a natural vital process and, like other natural vital processes, demands an abundance of energy for its accomplishment. The tendency at the present time is to use as little as possible in the form of drainage materials. If the greater part of the toxic material be removed, the lymphatics and leucocytes will attend to the rest better than can the surgeon with any complicated device. Sometimes, however, the amount of oozing necessitates the employment of a small drain or the infected peritoneum may secrete serum so rapidly and abundantly that it must be led externally by means of drainage, but this may be so small that it will not cause the patient any discomfort and will not interfere with the practically complete closure of the abdominal wound. The statistics of surgeons who do not use gauze packing, while being fully as good or even better than those who do, have been unjustly cited as arguments that severe cases had not been dealt with when gauze was not used.

Aseptic Surgery.—The remarkable advance which has been made in surgery during the past two decades has been due to the appreciation that cleanliness is the important factor in all operations. To destroy all germs has been the ideal of the antiseptic surgeon who

has an abiding faith in the ability of Nature to repair wounded tissue if only obstacles to repair be removed. C. McBURNEY (N. Y. Med. Jour., Mch. 22, 1902) after many years of close observation believes that much better results can be obtained by following the aseptic method, by which all bacteria are removed from everything which is to come in contact with the wound, the entrance of bacteria into the wound is prevented and the creation of any condition favorable to germ life is avoided. All instruments and dressings are sterilized by heat alone. The site of operation is cleansed in the most gentle manner. Twelve or twenty-four hours previous to the operation a soap application is made as follows: A piece of Castile soap is boiled in a little water till it becomes soft. It can then be spread like an ointment upon gauze which is applied directly to the area till the time of operation. A little soap and water are then used and removed with sterile water and ether. The sweat-glands and hair-follicles always contain bacteria which cannot be removed even by strong chemicals without destroying the skin, and they had better be left alone. The sterilization of the hands is the next important step and no one professes to be able to thoroughly sterilize them for more than a few moments at a time. Rubber gloves, therefore, should always be used. He enumerates as unnecessary appliances caps on the head, respirators before the mouth and complicated basins with foot attachments. The removal of all blood-clots and tissue débris, care being taken to bruise the exposed parts as little as possible, is a feature upon which considerable stress is laid. Complete aseptic work demands that wounds should be treated with the utmost care and delicacy. In the aseptic treatment of septic wounds it is entirely wrong to believe that a little more infection can do no harm. The same care should be observed as in clean wounds. When drainage is necessary it is much better to change the dressings frequently, so that there can be no accumulation of pus and serum, rather than to depend upon antiseptic and stimulating dressings. The surgeon must really believe that most wound diseases are preventable ones, that by strictly living up to his principles he can prevent them, and that no temptation is strong enough to induce him even momentarily to forget his creed. Painstaking attention must be given to detail.

Acidulated Alcohol in Surgery.—Despite strictest obedience to the laws of asepsis and antisepsis in the management of wounds united by primary intention, evidences of infection will at times present themselves to the chagrin of the most careful surgeons. L. DE GAETANO (La Reforma Medica, Mch. 4, 1902) has found his greatest success in the treatment of surgical wounds through the use of acidulated alcohol in the proportion of 100 grams of alcohol to 20 drops of acetic acid. This, in his experience, is not only microbicidal, as proven by bacteriological examination of tissues and sutures before and after its application, but also has the advantage of producing a condition of dryness unfavorable to the growth of bacteria. Prof. D'Antona's method of suturing is advised, namely, by having a needle at each end of the suture and passing it always from within outward, thus obviating the possibility of carrying infection from the deeper strata of the skin to the subcutaneous tissues. Gaetano details his method as follows: (1) The sutures should be kept in acidulated alcohol during the operation and dried with sterile gauze just before using. (2) As soon as the operation is finished, the surface of the wound should be bathed with acidulated alcohol and rubbed with gauze saturated with the solution, a gauze dressing, the first layers of which are saturated with acidulated alcohol, being applied. (3) After two days this procedure should be re-

peated. (4) On the fifth day the wound should be bathed with the solution, stitches removed, and dressing reapplied; the first layers, as before, being saturated with alcohol.

Histology of Intestinal Stenosis.—In that portion of the intestine above a stenosis there is often a thinning out of the wall as well as a hypertrophy. At first there is the compensatory hypertrophy for the excess of work demanded of it, and as this demand increases there comes a time when it cannot respond and then commences the period of atrophy. Again, one will meet with an atrophic condition where one would expect to find hypertrophy. M. PATEL (Rev. de Chirurgie, Mch. 10, 1902) believes that the histologic changes depend upon the conditions which produce the stenosis. The intestinal wall is hypertrophied when it is thickened more than normal, resistant to the finger and not compressible. This is not to be mistaken for the edematous condition in the wall above a recent stricture. To comprehend the production of the thickened condition one must understand the conditions in both extraperitoneal and parietal stenoses. Those of extraperitoneal origin produce simple dilatation or a hypertrophy. (1) Dilatation occurs in the course of a tuberculous peritonitis which produces a stricture, a diverticulum or an agglutination of loops of intestines, so that there is an intestinal dilatation often exaggerated and often reaching up to the duodenum. In all these conditions the caliber of the gut is diminished and the intestinal wall is thickened, normal or thinned. (2) Hypertrophy, usually the agent which produces the simple stricture, continues to be active for a long time; such as in the case of an old incarcerated hernia. Goullioud describes a case which had persisted for eight years in which the tumor appeared to be the stomach, so great were the dilatation and hypertrophy of the gut. In parietal stenosis there will be found simple dilatation as well as hypertrophy. Hypertrophy of the intestinal wall subjacent to a tuberculous stenosis is always present. The stenosis starts from a tuberculous ulcer in the mucous membrane and the thickening of the intestinal wall at times will extend as high as ten centimeters above the seat of the original ulceration. This condition is found also in ulcerations from trauma, syphilis, simple inflammation, dysentery, intussusception, but almost never after typhoid because of the direction of the ulcer. (3) Dilatation simple without modification of the intestinal wall is a very rare condition. In benign tumors such as myomata it is possible to have considerable stenosis without any change in the gut either above or below the stricture. Tallon described a similar condition in a case of polyadenoma of the intestine. In conclusion the author gives the following as the results of his investigations: (1) Below an intestinal stenosis the gut is often thickened; the seat, degree and age of the stenosis bear no relation to this thickness; this seems always to coincide with an actual lesion of the mucous membrane. (2) The pathological anatomy shows that the hypertrophy is formed of diverse elements, namely, (a) by a pathologic infiltration of the muscle fibers in which the fibers are solitary, dissociated, and of increased thickness; (b) throughout by a more marked infiltration of the cellular layers of the wall, subserous or submucous. (3) It does not contradict the physiological fact of a compensatory muscular hypertrophy. It is a false hypertrophy; this is a lesion of the wall of the gut of which the point of departure is at the plane of the ulceration of the mucous membrane. (4) From the point of view of the operator, the question would be whether the thickening below the stenosis would make any difference in the strength of the intestinal wall. The hypertrophied segment should be considered a re-

sult of the disease process, because in resection the sutures must be passed through healthy tissue and in consequence all hypertrophied intestinal wall should be removed.

Simultaneous Fractures of Both Clavicles.—Cases of this kind are rare and are generally the result of direct or indirect violence and cause so little functional disturbance that the patient has long since forgotten the accident that produced the trouble, according to C. Fénié and E. PAPIN (Rev. de Chirurgie, Mch. 10, 1902). If a case of simultaneous fracture of both clavicles be carefully examined, it will be seen that the fractures are not symmetrical; one cannot readily see how two blows can strike both clavicles symmetrically, and indirect trauma will not act symmetrically when inflicted from different directions. But one must admit the possibility of symmetrical fractures from muscular activity without symmetrical action, although no such case has been observed. Fractures the result of muscular action are less painful and one cannot admit that they may occur unknown to the patient; still less that they produce only a slight appreciable modification of function. The ordinary mechanism of fracture of the clavicle does not explain the existence of symmetrical fracture of both clavicles which exist unknown to the patient. Velpau reports a case of a patient, thirty-five years old, with a fracture of both clavicles at the junction of the middle and inner thirds, without union or much overlapping and unknown both to the patient and to his family. The literature on this question is very scant. Velpau and the author both believe that one must consider this condition to be of congenital origin. The question of trauma at birth due to forceps is ruled out as cases are reported in which the fractures have occurred and forceps have not been employed. The author thinks that during intra-uterine life there may occur convulsive muscular action which causes the symmetrical fractures of both clavicles.

Proximal Ligature in Traumatic Aneurism.—The usual teaching touching on the treatment of this condition is that the tumor should be incised and ligatures applied to the ends of the artery when found. Erichsen, in his recent tenth edition, goes so far as to say that a departure from this principle of treatment will probably result in death from gangrene. That the difficulty of this classic procedure is paramount will be doubted by none who have undertaken it, and particularly is this true of those aneurisms accompanied by the widespread lesions caused by high-velocity bullets. CECIL BIRT (Brit. Med. Jour., Mch. 15, 1902) cites six cases of traumatic aneurism treated by proximal ligation. They were as follows: Diffuse traumatic axillary aneurism caused by a Mauser bullet; similar aneurism of the axillary; the third lesion was similarly caused and occurred in the brachial; the fourth was a traumatic popliteal aneurism, the case being that of a guardsman who sprained his left knee while going up Majuba Hill; the fifth was also popliteal, but was caused by a bullet-wound behind the bones of the left leg; the sixth was that of the upper third of the radial artery, induced by a Mauser bullet which broke both bones. In all cases proximal ligation was practised. All the wounds ran an aseptic course and the results were in each case all that could be desired.

GYNECOLOGY AND OBSTETRICS.

Combined Extra and Intra-Uterine Pregnancy.—A case of this kind is reported by H. P. PERKINS (Boston Med. & Surg. Jour., Mch. 20, 1902). The patient passed her regular menstrual period without flow, and three weeks later had sudden sharp pains, cramp-like in character, low down in her right side. There was no nausea, no syncope, no evidence of shock. Three days

after this attack there was no abnormal sensation beyond a feeling of slight pressure and fulness near the site of the original pain. Bowels and kidneys were normal; temperature 100.6° F.; pulse 110. There were slight dulness and tenderness just below McBurney's point. The uterus was found to be in normal position, a little high, fairly movable and enlarged. Adnexa of left side normal. At the right side vaginal examination revealed a boggy, sensitive mass, extending from the uterus to the pelvic brim. The patient had been sterile for several years, but practically the only classical symptoms of extra-uterine pregnancy were this fact and the sudden pain. There had been no-bloody vaginal discharge, no decidua remnants. The uterus was evidently pregnant, and was not bound down or pushed to one side. The character of the onset, the pain, the slight dulness on percussion and the peculiar feeling in the vault suggested hematocoele. On median abdominal incision over twenty ounces of fluid blood and some clots escaped. A mass of adherent tissue was broken through and a bleeding-point found in the right tube, which was enlarged and ruptured close to the uterus. Notwithstanding great care in the manipulations the uterine fetus could not be saved. Flowing and pain began five days after the operation. The uterus was dilated and curret, the remains of an eight-weeks' fetation being removed.

Acetonuria in Pregnancy.—The metabolic changes incident to pregnancy would naturally direct one's attention to the index of metabolism, the urine. The significance of acetonuria in general not being well understood, such an investigation as that undertaken by MAX STOLZ (Archiv f. Gyn., Feb., 1902) in "Acetonuria in Pregnancy, Childbirth, and Puerperium," is highly welcome. He finds that a slight acetonuria corresponding to the physiological and found in pregnant women is not constant and is quite variable. Increased acetonuria is frequently found in the course of pregnancy, lasting for one, two or three days, without any symptoms or pathological causes. In the majority of cases during childbirth there is increased acetonuria. The longer the labor lasts the more frequently does acetonuria occur and the more abundant it is. In primiparæ it is more constant and greater than in multiparæ. During the first three days of the puerperium, occasionally during the first four days, it is considerably increased. More seldom it appears greatly increased later in the puerperium. The increased acetonuria of the puerperium is, as a rule, closely connected with the same condition during parturition. The influence of the establishment and the continuance of lactation upon this condition requires further investigation. Increased acetonuria in pregnancy and parturition is worthless as an index of the death of the fetus. It is a physiological manifestation, without any pathological significance or cause. It is explained by the alteration in fat metabolism during pregnancy and the succeeding states and, corresponding to it, is of irregular and transitory duration.

Epignathus.—A specimen of this rare anomaly, which has been described as "a twin monstrosity in which the parasite is united to the superior maxillary bone of the autosite," was recently shown by C. JEWETT (N. Y. Med. Jour., Mch. 22, 1902). These monstrosities present essentially the same structures that are found in dermoid cysts and their nature and origin are substantially the same. The author believes that they are developed from abnormal infoldings or inclusions connected with the hypophysis duct, which is an evagination of the pharynx to form the anterior lobe of the pituitary body.

The Causes of Eclampsia.—So numerous and varied have been the theories advanced as to the causa-

tion of eclampsia gravidarum, that it would be difficult to conceive of any new explanation, yet there is an element of originality in the experimental and critical investigation prosecuted by BLUMREICH and ZUNTZ and set forth in "Contributions on the Pathogenesis of Eclampsia" (Archiv f. Gyn., Feb., 1902). They experimented on pregnant dogs and found that these animals are more susceptible to the convulsive action of creatin than non-pregnant dogs, thus demonstrating in the former a greater irritability in the cortical motor cells. In this experiment the creatin served as an index of the irritability of the cortical cells; the investigators did not intend to prove that it is creatin that is the cause of puerperal convulsions. They conclude that a series of poisons are at work in the same way; that probably other stimuli, possibly mechanical, have the same effect. They claim they have sufficient evidence to conclude that the same hyperexcitability of the cortical cells, together with the presence of irritant poisons, lies at the basis of eclampsia in human beings. The facts of pathology show a certain tendency during pregnancy to diseases of the motor zone. Besides eclampsia, which is not infrequent, one case occurring in four or five hundred pregnancies, these are also met with tetany and chorea. They cite the observation of Windscheid that whenever a woman is attacked with tetany, it is during pregnancy or the puerperium. Likewise the phenomena of chorea, when they appear in an adult woman, do so almost always during the condition of pregnancy and disappear with its termination. Chorea, an ordinarily benign disease, acquires under the influence of pregnancy a character that makes it frequently a direct menace to life. During the pregnant condition much weaker stimuli are necessary to evoke convulsions than during the non-pregnant condition. It has never heretofore been affirmed that during pregnancy, in the constitution of the cortex of the brain itself, there is present a particular contributing cause which makes the stimuli so much more effective and dangerous. The question hinges partly, therefore, on this, Are there in the cortex certain characteristic changes that lie at the basis of the convulsions? Since in pregnancy there are appreciable variations from the normal blood distribution in the body, the authors incline to the thought that perhaps the increased supply of blood sent to the reproductive organs might lead to an imperfect nutrition of the cerebral cortex and occasion an alteration in the cells which would increase their irritability. At the same time there would be a heaping up of the products of metabolism, which would include the toxic substances aforementioned. In the particular condition of irritability of the cortical cells that is present in eclampsia, it needs no search for any special stimulus or class of stimuli to arouse it, for it may be aroused by all possible kinds of stimuli or combinations of them.

Placenta Previa.—A study of this condition by J. CLARENCE WEBSTER (Jour. Obst. and Gyn. Brit. Empire, Mch., 1902) is summarized as follows: The causes are low implantation of ovum, development of chorionic villi on the decidua reflexa, forming a reflex placenta or a combination of these two. Reflex placenta is probably a frequent cause of abortion and miscarriage by degeneration and thinning leading to hemorrhage. A case which reaches full term is generally one of low implantation of ovum; if abortion take place in the later months it is probably reflex placenta. In all cases of placenta previa hemorrhage may result from causes independent of the position of the placenta. In many cases of accidental hemorrhage, a reflex placenta is probably present.

Symphiotomy.—From experiments on twenty-eight female cadavers taken at random, A. C. SAND-

STEIN (Jour. of Obst. and Gyn. Brit. Empire, Mch., 1902) finds that 6 centimeters of separation is all that can be allowed, and this increases the true conjugate only 1 centimeter ($\frac{3}{8}$ inch); therefore the operation is useless if the true conjugate is less than 7 centimeters. The child, of course, must be living. Walcher's position is necessary to get the above increase. Sometimes there is a tendency to unequal movement on the two sides of the pelvis, and this must be counteracted as it may cause injury to the ligaments or viscera. The knife should have a broad blade, and the symphysis must be completely divided; but if the subpubic ligament be left, it prevents tearing down into the vulva. Ossification of the cartilage does not occur—at least, was not found even in subjects over seventy years of age. Sometimes the joint, not being in the middle line, is missed and the bone cut, and this often results in necrosis. Localized septic infection and death from sepsis have resulted so often that extremely rigid asepsis must be carried out, and a previous foul vaginal discharge is a contraindication to the operation.

Abortion in Pulmonary Tuberculosis.—By many authorities pregnancy is believed to exercise an unfavorable influence upon the course of tuberculosis, hence the question of its interruption by artificial means has arisen, the measure finding a certain number of advocates in France, Germany, and Italy. G. ZANONI (Gazz. degli Osped., Mch. 2, 1902) maintains that, in general, abortion should not be induced after the third month, exceptionally in the fourth. During and after the fifth month the usual indications in the non-tuberculous should be observed, pulmonary tuberculosis alone not justifying so grave a procedure in the later months. Tuberculous cases of more recent origin, of from four to six months' duration, are regarded as most promising; rapid, toxic cases, with anemia, anorexia and adynamia urgently demand the operation and benefit from it. Evidence of pyogenic invasion and tuberculous cachexia antedating pregnancy are contraindications to the measure. In those for whom the operation is contemplated the pulse should not exceed 100, taken in the morning while the patient is in the horizontal position after five minutes' complete rest without coughing; and the temperature should not be, during a period of three or four days' observation, higher than 99 or 99.3° F.

THERAPEUTICS.

Lupis Vulgaris.—Two cases of lupis vulgaris successfully treated with urea pura and the X-rays are reported by E. SWALES (Lancet, Mch. 8, 1902). The dose of the urea was begun at 20 grains three times a day and gradually through about nine months of treatment increased to 120 grains three times a day. During this same time the patients were subjected to X-ray treatment with the result that the cure was more rapidly established in these two severe cases than is usual with the X-rays alone. The points which the author emphasizes are (1) the use of a low-pressure tube, *vis.*, six inches; this does not produce any severe dermatitis in the neighboring healthy skin; (2) the comparatively short duration of the treatment is essential and close attention must be given to the importance of general health, lungs, heart, emotional condition and anemia. His cases without cure were puckering of the skin and unsightly contractions, which were commonly seen in the days when scarification was considered the best means of treatment. The objection to urea is that it is very expensive.

Corrosive Sublimate in Pertussis.—Fifty-six cases treated with this drug furnish the material for a paper by C. CALASSO (La Pediatria, Year X., No. 1, 1902).

Treatment consists in painting the throat with sublimate and sodium in the following proportion:

Corros. sublimate	50 (gr. viii)
Sodium chloride (chem. pure)	10 (gr. ii)
Distilled water.....	1000. (5xxxij)

M. and filt.

All accessible parts of the pharynx, epiglottis, tonsils, etc., should be painted with a soft, long-handled brush dipped in this solution, from once to three times daily, according to the severity of the case. The writer advises that the patient be fed before painting to prevent irritation of the empty stomach by the small quantity of the solution which is swallowed during its application and to obviate the possibility of local disinfection being neutralized by ingestion of food immediately after the painting. Of the fifty-six cases, ranging from four months to thirty-three years of age, thirty-nine were cured with one daily application, and seventeen more serious cases with complications received two or three daily applications, supplemented by the remedies commonly used in pertussis. In all a cure was effected in from ten days to one month. The value of this method of treatment is believed to depend upon sterilization through the corrosive sublimate (this, too, diminishing the risk of contagion) and the action of sodium chloride rendering the secretions more fluid, thus facilitating their expulsion and diminishing the number of paroxysms. As a prophylactic measure for those who come in contact with the patient, daily applications of the solution to the throat have been found useful.

Dionine in Whooping-Cough.—Among those who have obtained good results from the administration of dionine in whooping-cough are L. GOTTSCHALK and R. SCHMIDT (Bull. gén. de Thérap., Mch. 8, 1902). The former states that while the duration of the disease is not affected the paroxysms are diminished notably in duration and intensity. Schmidt believes that he witnessed in addition a shortening of the course of the disease. A useful combination in pertussis and in bronchitis, pneumonia and respiratory disease in general, consists of dionine and creosotal. An advantage which dionine possesses over morphine is that its sedative influence is not accompanied by any inhibition of expectoration.

Treatment of Osteo-arthritis of the Spine.—The treatment of this condition is of more importance than is commonly supposed. The disease is probably in part a trophic process; hence all debilitating medicines and methods must be avoided. This includes various depressing so-called antirheumatic remedies, also courses of baths. The general treatment, writes J. E. GOLDTHWAITE (Boston Med. & Surg. Jour., Mch. 20, 1902), should be nourishing and stimulating. Good elimination is essential. Extra diet, stimulating bathing, massage of unaffected parts, electricity in a mild current, are all of value; dry heat is useful if not used too often. Iron, arsenic and strychnine suggest themselves. Cod-liver oil and medicinal doses of alcohol are recommended. The mechanical treatment consists of some form of support which will limit the motions at the seat of disease. Complete fixation of the spine is indicated if the symptoms be acute. Simple recumbency is not enough, as considerable spinal motion is still possible; it is wiser to use a plaster jacket or one made of stiffened leather. The jacket can best be applied with the patient standing and assuming the most erect position possible without pain. Suspension, forced hyperextension, or any other method of correction of the position is not indicated, as they would all produce strain or pressure on the diseased areas. If much deformity exist the jacket should be reapplied every one or two weeks until the deformity has been corrected as much as pos-

sible. In subacute or mild cases a support less rigid than a jacket suffices; it may consist of a light brace with uprights in the back made of light steel, or a corset made of heavy webbing reinforced with flexible steels. At times adhesive strapping or a swathe pinned tightly about the body may give relief. Local warmth is always agreeable. Goldthwaite describes in detail the behavior of the different types of spondylitis deformans under treatment.

Dionine in Pulmonary Disorders.—As is apparent from the article by A. SCHERRER (Therap. Monatshft., Mch., 1902) the chief use of dionine in pulmonary disorders is to diminish irritation, so that the troublesome and in patients with a tendency to hemorrhage dangerous cough will disappear generally in a few days. The expectoration is not diminished, as happens so often with even small doses of morphine, and the pain is moderated, though not markedly in tuberculosis of the larynx. Since the cough is removed, the insomnia will disappear and the sleep is more prolonged and peaceful and with fewer sequels than with morphine. The author has had no experience with the drug in hemorrhage; he recommends a trial in the milder cases, but in the more serious ones recourse should at once be had to morphine. Disturbances of digestion, anorexia, vomiting or constipation do not occur and the patients do not seem to develop a tolerance, as is the case with morphine.

Methylene-blue as a Sedative.—The depressing effects of this drug noted when administered in cases of nephritis has led to its trial in various forms of mania and paretic dementia with reported success. Further observations of its effects are submitted by D. E. HUGHES and E. LOVELACE (Phil. Med. Jour., Mch. 22, 1902), who gave it in twenty-two cases. These were nearly all cases of wild excitement when the drug was used and in but six did it fail to produce a calming effect which did not resemble the sedative action of other drugs, but seemed rather a natural quietude; the patients were relieved of excitement, but without dulness or hebetude. The effect was noted three or four hours after a dose was given and lasted from fifteen to twenty-four hours. * In the majority of cases, one grain was given b. i. d. or oftener, hypodermatically; in the remainder two grains were given in capsule. In only one instance did depression result. In each case the patient slept well at night, but in none did it produce sleep during the day. The only unpleasant symptom which could be attributed to the drug was the vertigo noted in one patient. The development of abscesses was an annoying complication in the first cases, but was readily overcome by boiling the solution for hypodermic use. Administration by mouth was marked by total absence of all gastro-intestinal derangements. If future administrations confirm these results a valuable remedy has been discovered for controlling many patients suffering from incurable mental disease.

EYE, EAR, NOSE, AND THROAT.

Acute Catarrhal Conjunctivitis.—As a result of studies on the causes of this disease and the bacteriology of the conjunctival sac, the principal points of interest are summarized by P. C. JAMESON (Brooklyn Med. Jour., Mch., 1902) as follows: The disease is probably not a bacteriological one in its etiology, but acute or more often chronic hyperemia of the conjunctiva is the exciting cause. The condition resulting from this vascular derangement is a change in the fluid constituent of the conjunctival sac and this in turn gives to organisms already existent in the sac, principally the *staphylococcus epidermidis albus*, a suitable nidus for rapid propagation.

THE MEDICAL NEWS.

A WEEKLY JOURNAL
OF MEDICAL SCIENCE.

COMMUNICATIONS in the form of Scientific Articles, Clinical Memoranda, Correspondence, or News Items of interest to the profession are invited from all parts of the world. Reprints to the number of 250 of original articles contributed exclusively to the MEDICAL NEWS will be furnished without charge if the request therefor accompanies the manuscript. When necessary to elucidate the text illustrations will be engraved from drawings or photographs furnished by the author. Manuscript should be typewritten.

SMITH ELY JELLIFFE, A.M., M.D., Ph.D., Editor,
No. 111 FIFTH AVENUE, NEW YORK.

Subscription Price, including postage in U. S. and Canada

PER ANNUM IN ADVANCE	\$4.00
SINGLE COPIES10
WITH THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, PER ANNUM	\$6.00

Subscriptions may begin at any date. The safest mode of remittance is by bank check or postal money order, drawn to the order of the undersigned. When neither is accessible, remittances may be made, at the risk of the publishers, by forwarding registered letters.

LEA BROTHERS & CO.,
No. 111 FIFTH AVENUE (corner of 18th St.), NEW YORK.

SATURDAY, APRIL 19, 1902.

THE SOCIAL EVIL AND THE REPORT OF THE COMMITTEE OF FIFTEEN.

It is well known that certain revelations made in the fall of 1900 concerning the appalling conditions of vice in the East Side tenement district of New York City which shocked the moral sense of the community led to the formation of the Committee of Fifteen.

This body of prominent, public-spirited citizens courageously undertook the task of suppressing certain evils which had long existed with the full knowledge of the police and had, as it appeared, been fostered by the connivance and complicity of the police officials. Largely through the instrumentality of this committee prostitution was expelled from the tenements of the East Side district, the tenement-house bill was created by the Legislature, the infamous "cadet system" of traffic in prostitution was exposed, many of its perpetrators punished and evidence was collected which led to the closure of many notorious disorderly and gambling houses in this city.

While a crusade against prostitution was in no sense the object of the Committee's creation, yet the most conspicuous results of its work have been the suppression of certain revolting phases of this evil; it was eminently fitting, therefore, that the official announcement of the work accom-

plished in the interests of public morals and decency should appear in connection with a report on the social evil, with especial reference to the conditions existing in New York City.

The report is divided into two parts. The first is devoted to an historical résumé of the history of prostitution with the measures employed at different epochs and in different countries for its suppression or control. This part of the work, prepared under the direction of a subcommittee, is an admirably clear and comprehensive exposition of the problems involved in prostitution; the discussion of these problems is conservative in spirit and judicial in tone. From the medical standpoint, the criticism may be passed that the subject is approached from a too exclusively ethical point of view and that it constitutes a special plea against the official intervention of the public authorities in the regulation of prostitution by sanitary supervision; it may also be claimed that the physical evils which flow from prostitution are rather minimized below their just proportions, while an overshadowing importance is given to the moral aspect of the question.

The sanitary aspects of regulation are considered in detail, and this system is declared to be not only wrong in principle but condemned by its practical results. The superior advantages of what is termed the moral regulation of vice, in which is incorporated the sanitary features of increased hospital facilities and free treatment, are fully set forth.

"The fundamental opposition between moral and sanitary control" is perhaps too strongly emphasized. It may be admitted that a system of control based upon hygiene alone and which ignores the moral questions involved is indefensible. Prostitution distills a double venom, it poisons both body and soul; it has a moral as well as a physical side. Both sides of the shield should be kept in view in instituting measures for its control. The reglementarist in dealing with venereal diseases would sweep aside all ethical considerations which stand in the way of treating it as a purely sanitary problem. The policy of this movement encounters a strong hostility from the moral element in society. But instead of abrogating all sanitary control, a system should be devised in which the divergent, though not opposing, interests of sanitation and ethics should alike be respected. Certainly the Continental system of regulation does not represent the highest wisdom of sanitary science or the perfection of sanitary methods—certain odious features, such as the arbitrary arrest of women on suspicion, the

inscription and licensing of prostitutes, might be eliminated with advantage. We believe that if the spread of venereal disease is ever to be checked and its ravages as a social plague stayed, it will be largely through the instrumentality of the medical profession; on the other hand, we believe that the source or causes of prostitution can only be reached and repressed by an improvement in the socio-economic factors concerned in its production and by developing all conditions which conduce to public morality. In other words, a union of both medical and moral forces constitutes the proper basis of an effective organization and plan of action in the prophylaxis of venereal diseases.

Part II. contains the conclusions and recommendations of the Committee, with an appendix setting forth the present conditions of vice in New York. These recommendations, briefly summarized, are as follows: "The better housing of the poor, purer forms of amusement, the raising of the condition of labor, especially of female labor, better moral education, minors more and more withdrawn from the clutches of vice by means of reformatories, the spread of contagion checked by more adequate hospital accommodations, the evil itself increasingly condemned by public opinion as a sin against morality and punished as a crime with stringent penalties, whenever it takes the form of a public nuisance." With a discrimination which is creditable to the good sense of the Committee, public provocation is recognized as the only tangible form of prostitution which can be reached by constitutional law, and the recommendation is further made that while all obtrusive manifestations of vice should be sternly repressed, houses of ill-fame in certain retired localities should be undisturbed, as long as they remain unobtrusive.

While these recommendations of the Committee are based upon wisdom and sound morality and are to be commended from any point of view, it requires a good deal of optimism to believe that they promise to yield immediate results in checking the spread of venereal diseases—in which the medical profession is chiefly interested. The social evil is a chronic disease and requires a chronic treatment. Influences which act as a regenerating force upon the morals of a community or a nation are slow in operation and the material conditions which affect the methods or means of living cannot be controlled or regulated. Even the Committee can only hope from the application of the above measures in dealing with the social evil, "for the abatement of some of the worst of its

consequences at present and for the slow and gradual restriction of its scope in the future."

In our opinion not the least valuable outcome of the work of the Committee of Fifteen is this presentation of information respecting the social evil in a form which renders it accessible to the general reading public. There has always been what may be termed a conspiracy of silence upon the part of the public press, public educators, and religious teachers in relation to this subject which possesses such superior significance as a social danger. All knowledge of the social evil has been considered a sealed book to be opened only by the prurient minded or the curious. The attempt to popularize such knowledge is a step in the right direction. It is a reversal of the ostrich policy of society which shut its eyes to the dangers that threaten the social body and thinks by ignoring to escape them.

The facts which are embodied in this report on the social evil are well known to medical men; indeed, they are largely derived from professional sources, but it is a singular commentary upon the anomalous attitude of the public press toward such matters that while this report emanating from a committee of laymen is favorably noticed and commended to the reading public, a treatise covering the same ground, coming from a medical man, would be passed over in silence.

WHAT IS DIABETES? A STEP IN ADVANCE.

IN the MEDICAL NEWS of February 1st we published an interesting and highly suggestive paper by Drs. C. A. Herter and A. N. Richards on a form of glycosuria induced by the action of the active substance of the suprarenal gland, adrenalin.

The researches of Blum, Luelzer and Croftan have all established the fact that glycosuria follows the subcutaneous use of this principle, but we are indebted to more recent researches of Dr. Herter, the results of which were given before the New York Academy of Medicine and the Philadelphia Pathological Society last week, for a more complete understanding of the causes underlying this phenomenon.

Led by the fact that intraperitoneal applications of andrenalin were followed by greater amounts of sugar in the urine than were observed following other modes of application, Dr. Herter was brought to believe that this was because of a local action of the remedy on the pancreatic cells. This he proved by a new mode of experimentation, namely, the direct application of weak solutions of the drug to the pancreas itself by means

of a brush. This painting of the pancreas regularly induced large amounts of glycosuric urine, whereas local applications of similar solutions to the spleen, the kidneys, the liver and the viscera were not followed by any marked glycosuria. It was observed at the same time that the pancreas became deep red in color, contrary to expectation because of the well-known blanching action of suprarenal substances. It was further shown that the glycosuria was more marked if the animal experimented on had been fed recently, thus having considerable carbohydrate material in transit between the digestive tract and the liver.

In attempting to explain this peculiar action of adrenalin upon the pancreatic cells, Dr. Herter was first inclined to believe that the results were due to the well-known vasomotor action of this substance, but decisive experiments proved this hypothesis untenable; increased blood-pressure was also shown to be a non-important factor and the conclusions finally arrived at were striking and far-reaching in their significance.

The clue to a rational explanation was afforded by the observations of Geppert, made some ten years ago, that in poisoning by hydrocyanic acid the striking change from blue venous blood to bright arterial blood (within the veins), known to Claude Bernard and some of the older physiologists, is associated with an increase in the oxygen in the venous blood and a great decrease in the carbon dioxide. That this phenomenon depends on the inability of the cells to take up oxygen from the blood is shown by the fact that in hydrocyanic acid poisoning the quantity of oxygen utilized in the organism is greatly diminished. On applying dilute solutions of potassium cyanide to the pancreas the organ becomes a brilliant red and is associated with glycosuria of rapid onset.

This idea of impaired oxidizing capacity led Dr. Herter to apply numerous reducing substances to the pancreatic cells by his method of local painting, and thus temporarily to deprive the pancreatic cells of their oxygen and probably of their oxidizing power. Sulphurous acid, carbon monoxide, benzyl alcohol, ammonium sulphide, hydroxylamine and paragallol, all well-known reducing substances, were tried and almost uniformly their local application to the pancreas resulted in marked glycosuria. Since adrenalin has been shown to contain pyridin-like bodies, Dr. Herter applied weak solutions of this alkaloidal base to the pancreas and ob-

tained a slight glycosuria; piperidine, a closely allied alkaloid with much greater reducing power, gave rise to a very marked glycosuria; whereas the application of solutions of quinoline, a chemically intermediate body, gave rise to an intermediate grade of glycosuria. It was further shown that if adrenalin be oxidized and thus deprived of its reducing power by potassium permanganate, chlorine gas or other oxidizing agent, its application to the pancreas no longer gives rise to a glycosuria.

The application of strong oxidizing agents to the pancreas, such as potassium permanganate, chlorine water, chromic acid, and hydrogen peroxide, was *not* followed by glycosuria.

It seems almost conclusive, then, that an interference with the internal oxidizing power of the cells of the pancreas, is responsible in large part for the production of diabetes. There is probably a loss of relationship in many instances between the amount of reducing substances in the blood, some of which are manufactured in the suprarenal gland, and the oxidative power of certain enzymes elaborated by the cells of the pancreas.

THE THYROID IN NOSOLOGY.

AFTER a phase of acute interest on the part of the general practitioner because of the promise of its presumed therapeutic effects, the thyroid gland seems about to drop back to a position of secondary importance. It is the usual pendulum-like swing of medical ideas, especially in the department of therapeutics and therefore should not occasion much surprise.

There is no doubt, however, that considerable knowledge as to the function of the thyroid has been gained and that even the present comparative obscurity of the subject promises to be fecund in further advances of sterling scientific character. What has been learned recently has pointed particularly to the occurrence of functional derangements of thyroid secretion, some of them, as pointed out recently by Dr. Meltzer before the New York Academy of Medicine, due to inhibitory processes.

There seems to be no good reason to question that failure of development; and especially the condition known as infantilism, whether this be universal or limited to one system as the genital or reproductive, is usually associated with a defective thyroid gland or at least abnormally small thyroid secretion. The connection between reproduction and the thyroid is very suggestively illustrated by Prof. Gautier's work on the pres-

ence of arsenic and iodine in menstrual blood. While the normal blood of females contains no arsenic and only a trace of iodine, menstrual blood contains a very noteworthy amount of arsenic and considerably over four times as much iodine as does normal blood. Gautier has demonstrated that the thyroid gland is the main organ within the body the metabolism of which leads to the elimination of arsenic and iodine. It is well known that the thyroid enlarges during pregnancy and in many women just before the menstrual period. It may be that there is in women an abnormal production of arsenic and iodine just before menstruation and that these substances are eliminated at this time. A normal thyroid contains just about the amount of arsenic that is eliminated each month in the menstrual blood, so that there is a constant manufacture of this substance until a certain maximum is reached, when removal takes place.

The arsenic and iodine products of the body are, according to Prof. Gautier, used for the growth particularly of hair and nails. These grow more luxuriantly in man than in woman, hence there is less tendency to the accumulation of such products in males. Besides, the thyroid in the male does not seem to be so persistently active an organ as it is in the female. There are, moreover, good authorities who claim that there is a certain periodicity in male sexual function that may be attributable to this accumulative discharge. In a word, something of the explanation of certain vexed problems in sexual physiology may be suggested by these discoveries of Gautier's that have now been over a year before the public with but the single contradiction of Cery's work that does not invalidate them.

At the regular October meeting of the Harvard Medical Society of New York City (MEDICAL NEWS, Nov. 16, 1901) Dr. Perry called attention to a series of cases in which the symptoms of neuro-arthritis, rapid heart and disturbed menstruation, were associated with some inhibition of the normal body thyroidism, for relief was obtained by the administration of thyroid extract. None of Dr. Perry's cases showed any signs of intolerance and their other symptoms were relieved.

It is evident, then, that we are on the track of organic relations of the closest kind between the thyroid and the genital system. Another proof of this is to be found in the undoubted benefit, though unfortunately not as much as was at first anticipated, that accrues from the treatment of carcinoma of the breast by oophorectomy fol-

lowed by injections of thyroid extract originally suggested by Beatson of Glasgow and tried by many surgeons with surprisingly good results.

It is well known that tendencies to obesity are often associated with certain phases of the sexual life. Just after puberty and after the menopause women are liable to put on weight, while in boys the obese tendency may be exhibited just before puberty. In these cases the use of thyroid gland has been found useful for the treatment of the affection. Obesity is sometimes associated with an instability of the blood-making organs that causes any attempt at reduction in weight by systematic lessening of the diet to bring on marked chlorotic symptoms. These cases of obesity are often considered absolutely hopeless of successful treatment. They are especially amenable to treatment with thyroid extract and according to French observers the use of arsenic in combination with regulation and limitation of the diet will bring decrease in weight without manifestations of anemia, if the reduction be not made too rapidly.

Although we hear less of the enthusiastic recommendation of thyroid extract for nearly everything under the sun, and a few other things besides, that characterized the therapeutics of a few years ago, there is a strong undercurrent of feeling founded on careful clinical observation and delicate scientific investigation which shows that some really important acquisitions to our knowledge have been made. There remains at the present moment much for the clinician to do in demonstrating the practical application and limitation of these recently acquired ideas. There is an excellent field for the hospital physicians of the country to demonstrate that work of a thoroughly scientific character out of the domain of surgery can come from our American hospitals.

ECHOES AND NEWS.

NEW YORK.

Resolutions on the Death of Dr. Mundé.—At a recent meeting of the Medical Board of Mt. Sinai Hospital, the undersigned having been appointed a committee to draft resolutions on the death of Dr. Paul F. Mundé, reported as follows: *Whereas*, Dr. Paul Fortunatus Mundé, after a faithful service at Mt. Sinai Hospital of nineteen years, has been removed by an untimely death; and *Whereas*, His colleagues of the Medical Board had special opportunity during all these years to recognize in him the skilful physician and to esteem him as a devoted friend; *Therefore*, Be it resolved that the Medical Board of Mt. Sinai Hospital place upon its minutes this record to show its appreciation of the great loss which the Hospital has sustained; that it extend its sympathy to his family in their great sorrow, and that a copy of these resolutions

be sent to them and be published in the medical journals of this city.

(Signed) { ALFRED MEYER, M.D.,
HENRY KOPLIK, M.D.,
HOWARD LILIENTHAL, M.D.

Resolutions on the Death of Dr. Edwin M. Pyle.
—*Whereas*, It has pleased the Almighty to suddenly call from us our esteemed and respected colleague Dr. Edwin M. Pyle, and, *Whereas*, For several years past he had zealously devoted himself to the special field of otology, distinguishing himself in the hospital by his unselfish industry and superior skill as an operator, and winning in these meetings the esteem and admiration of his colleagues for his sincerity of purpose and genuine devotion to the advancement of this special branch of medical science, therefore be it *Resolved*, That, while we accept submissively the decree of Divine Providence, the members of this Section as associates in the field of otology and as coworkers in the New York Eye and Ear Infirmary to which deceased was attached, desire to record the sense of loss which they have sustained in the sudden taking away of their fellow practitioner, and, it is further *Resolved*, That the members of this Section extend to the family and friends of deceased their heartfelt sympathy and sincere condolence in their bereavement, and that these resolutions be spread upon the records and a copy be sent to the family and to the medical journals for publication.

(Signed) { JAMES F. MCKERNON, M.D.,
FRANK J. BLODGETT, M.D.,
JOSEPH KENEFFICK, M.D.

Syllabus of Bacteriology.—This is the title of an excellent small manual issued free to physicians by the Palisade Manufacturing Company of Yonkers, N. Y. The publishers are to be commended for their good judgment and taste in this excellent treatise. It is an ethical and praiseworthy form of advertising.

Resolutions on the Death of Dr. Tucker.
—*Whereas*, An inscrutable Providence has removed from our fellowship an honored member, Ervin Alden Tucker, A.M., M.D., suddenly, in his prime, with only the first sheaf of life's harvest garnered; and *Whereas*, The Fellows of the New York Obstetrical Society, from long association, have grown into a knowledge of his rare qualities and exceptional equipment for the high sphere of usefulness he had made for himself in his profession; and *Whereas*, As members of his own guild and calling, thereby entering into a juster appraisement of his skill and capacity, the Fellows of the New York Obstetrical Society especially esteem their departed brother for his unusually long, painfully laborious and self-contained preparation in the hospital wards; his tireless fidelity as observer and statistician; his methodical evolution of a technic in obstetrics; his soundness and directness as a teacher, carrying his formative influence through medical graduates of the last decade to bedsides far beyond his personal ken; his kindly, active, almost paternal interest in each individual of the large family of medical men he himself selected from the city hospitals and trained as obstetricians; his cohesive power in holding the hospital alumni in fraternal bond; his quiet, self-poised yea and nay which inspired in patients a merited confidence, marvelously rooted; his clean life; his high conception of the responsibility and dignity of the holy office of ministrant at the threshold of life; therefore be it *Resolved*, That the Fellows of the New York Obstetrical Society spread upon their records their pride in the fame of their honored Fellow, their appreciation not only of his individual work, but also of the spiritual power of his completed and crystallized life-lesson, which will ever be a stimulus to younger men in the

profession; be it further *Resolved*, That a copy of these resolutions be conveyed to the bereaved family as a token of sympathy, appreciation, and consolation in that our brother, "though dead, yet speaketh."

(Signed) { E. C. SAVINGS, M.D.,
J. C. EDGAR, M.D.,
G. L. BRODEHEAD, M.D.

PHILADELPHIA.

Fire at Samaritan Hospital.—A recent fire at the Samaritan Hospital caused a damage of \$500. In some unknown way it originated in the residents' rooms and was luckily confined to that part of the building, although many personal effects were destroyed.

Surgeons Sail for Europe.—Dr. John B. Deaver, accompanied by Dr. G. G. Ross, assistant-surgeon at the German Hospital, sailed for Europe April 8th, to be gone about two months. The leading clinics of London, Paris, Heidelberg, etc., will be visited. Dr. William M. Thompson has also sailed for Europe.

Ambulance Wrecked by Trolley-car.—An ambulance of the Pennsylvania Hospital, while conveying a case of uremia from the Broad Street station April 11th, was in collision with a trolley-car at Thirteenth and Spruce Streets. The patient, the physician in charge, the driver, and the horse were injured and the ambulance was wrecked. None of the injured persons was seriously hurt.

Federation of Day Nurseries.—The biennial conference of the above organization met here during the past week. It is of interest to note that the first day nursery in this country was established in Philadelphia in 1863. The age limits are three weeks and twelve years and a charge of five cents per day is made. In the summer excursions to the park are made weekly and last summer forty of the children were sent to Atlantic City for a week. The health of the children cared for has been uniformly excellent.

State Medical Examining Board.—This Board was reorganized at a meeting held April 1st by the election of Dr. Henry Beates, Jr., of this city, as president, and of Dr. Hiram S. McConnell of New Brighton, as secretary. The examinations for the coming summer will be held in Pittsburg and Philadelphia June 25-28, 1902.

Society to Prevent Tuberculosis.—The annual meeting of the Pennsylvania Society for the Prevention of Tuberculosis was held in this city April 9th. Provision was made for the wider distribution of literature designed to educate the masses as to how best prevent communicating the disease. Letters from various parts of this country and Canada, requesting copies of the tracts issued by the Society were regarded as indicating that the work of the Society is spreading beyond the bounds originally outlined. Dr. Howard S. Anders was chosen president, and Dr. A. H. Davison secretary.

Glycosuria from Adrenalin Chloride.—Dr. C. A. Herten of New York, as the invited guest of the Philadelphia Pathological Society on April 10th, detailed some exceedingly interesting experiments made upon dogs for the purpose of investigating the question of glycosuria. Adrenalin chloride was at first used intraperitoneally, the injection of from three to five cubic centimeters being followed by the appearance of sugar in the urine. The duration of this glycosuria was twenty-four hours or less. The sugar of the blood in the animal used was found to increase very rapidly after the administration of the adrenalin, except when a partially starved dog was used when this increase was very slow. This led to the conclusion that the amount of glycogen in the liver exerted a strong influence upon sugar production. Some of the physiological and pathological changes caused by fatal doses of the drug were hemorrhagic pancreatitis, focal necroses, and intense

congestion of the gut. After intravenous injection of adrenalin, with the production of glycosuria, the pancreas was examined microscopically, but no changes were found. The fact that intraperitoneal injections were much more effective in producing glycosuria than were subcutaneous or intravenous methods of administration led to the hypothesis that this was caused by the drug reaching the pancreas more directly. Acting on this hypothesis the pancreas of a dog was exposed and a solution of adrenalin painted upon the organ. This was followed in a few minutes by the appearance of sugar in the urine. A repetition of this, with control experiments, led to the conclusion that the glycosuria following the use of adrenalin is a passive glycosuria caused by changes in the pancreas. But how is this brought about? The first idea was that it was due to the vasmotor influence of the adrenalin. Experiments decided against this as there was no change in color of the pancreas when the adrenalin was given intravenously, and careful observations showed that a general rise in blood-pressure was not necessary for the production of glycosuria. Experiments with potassium cyanide led to the thought that the result was due to the lack of oxidation. Experiments with many oxidizing and with many reducing agents were then made, care being taken to corroborate these in each instance with controls. The result was that with powerful oxidizing agents no sugar was obtained, while with reducing agents sugar was made to appear in the urine. Interference with the oxidative function of the pancreatic cells thus appears to be the cause of the glycosuria. Dr. Herter advances no theory as to why this is caused. This theory would explain the rise of sugar in the blood during asphyxiation and the production of glycosuria after hemorrhage. On this supposition, if the reducing power of the blood be out of proportion to the capacity of the pancreas, glycosuria will follow. An interesting study would be to determine if reducing substances were found in excess in actual cases of diabetes. Dr. Herter stated that one of the most valuable suggestions arising from his experiments was that of the direct application of poisons to individual organs. He believes that experiments in that line will help much in solving many of the problems of physiology. Perhaps in this way may be located the origin of uric acid, glycuronic acid, and other little understood products.

Death of Noted Masseuse.—Miss Jessie Miller Ward, said to have been the first person in this city to teach massage upon a scientific basis, died April 6th in the Presbyterian hospital. Miss Ward entered the Women's Medical College here in 1899, but after two years' study her eyes failed and she was obliged to abandon hope of entering the medical profession. She then turned her attention to massage. Success in that work soon caused her to organize classes for instruction to the nurses of the Women's Hospital. Courses were afterward established in the training schools of many of the hospitals of the city. Three years ago Miss Ward published "Notes on Massage," a manual which gained extended recognition.

CHICAGO.

Money for Charity.—The German-American Charity Association has obtained donations amounting to \$12,000 which will be distributed among the following charities: Alexian Brothers' Hospital, German Hospital, St. Elizabeth's Hospital, Chicago Maternity Hospital, Home for Destitute and Crippled Children, Visiting Nurses' Association, Chicago Orphan Asylum, and five non-medical charitable institutions.

Suspension of Undertakers.—The Commissioner of Health has suspended the licenses of two undertakers, Bernard McNeil, 2915 State street, and Jacob

Winstein, 264 W. Fourteenth street, on charges of carelessness and violating the rules laid down for the interment of the bodies of scarlet-fever patients.

Prevalence of Scarlet Fever.—Scarlet fever has been for some months, and still is, more prevalent and more fatal in Chicago than at any time in the last seventeen years. Since the first of the year there have been 167 deaths reported from this disease out of a total of 7,318 deaths from all causes—a proportion of nearly 2.3 per cent. The nearest approach to this was in 1884, when the scarlet-fever mortality formed nearly 2.5 per cent. of the total. Last week there were 243 cases of contagious diseases reported, of which number 162, or exactly two-thirds, were scarlet fever. During March 644 cases were reported as against 156 in March, 1901.

Chicago Medical Society Celebrates its Semicentennial at the Auditorium.—Fifty years of medical practice in Chicago were reviewed by the speakers at the banquet of the Chicago Medical Society at the Auditorium, April 9th, celebrating the semicentennial of the organization. Dr. Alexander Hugh Ferguson, Vice-President of the Society, acted as toastmaster. Dr. N. S. Davis, who founded the Society in 1852, came for the speech-making, and warned physicians against attempting too many things in their practice. He said: "I have heard of doctors in Chicago who are attached to so many hospitals that it seemed to me that if they visited each one during the week they would accomplish nothing else. We, like the men in many other professions, are prone to attempt too much. A man should occupy the field he intends to cultivate and work it well, but he must not try to cultivate the earth."

The chair at the center of the speaker's table, which would have been occupied by the late Dr. Christian Fenger, who was president of the Society, was left empty and draped in black. Dr. Frank Billings gave an eloquent tribute to Dr. Fenger, and at his request the audience drank a silent toast to the memory of the departed member.

The proceedings took on the nature of a tribute to Dr. Davis. Every speaker directed a number of compliments to where he sat, half-hidden behind a vase of flowers, and when he arose to speak the applause lasted for several minutes. The three hundred banqueters drank his health standing, when he concluded his remarks. "My work is nearly over," said the aged physician, "and I find that I can do only a little every day and then rest in my comfortable home and wait for the end to come. I am happy that I have lived so long and have seen the growth of this Society from its small beginning to the 1,100 members it now has. I cannot attend your night meetings, but I can sometimes break over the rules, as I did to-night, for the pleasure of seeing you again. I thank you for your cordial reception and hope to see you all many times." Dr. Davis told of the start of the Society and the different crises through which it had passed. To show the way in which physicians were divided into warring factions when the city was young, he related the story of a man whose leg had been nearly torn off in a street accident. Several doctors of one clique had made preparations to hold the operation where the accident happened, when another faction arrived and succeeded in driving the first lot away from the patient. One physician of the time, he said, kept up his reputation with "thunder and lightning" pills.

Dr. J. T. McAnally, President of the State Medical Society, spoke on "Organization of the Medical Profession." He said the time has come when the medical societies must enlarge their scope. "Medical men are coming to believe that the scope of our societies if too narrow," he said. "We cannot longer ignore material and social interests of the members if we are to keep

a compact organization. The matters of uniform fee bill, "dead beat" practice, offenders against the medical statutes, and other things can be taken up through the societies."

Dr. I. N. Danforth, one of the older members, gave a number of reminiscences of the early days of the Society, and the different methods of practice then in vogue. The medical paper of the evening was on typhoid fever, and was read by Professor V. C. Vaughan of the University of Michigan.

Illinois Medical Practice Act and Osteopathy.—The Supreme Court of Illinois says, in the case of People, to Use of State Board of Health, vs. Gordon, that it thinks it clear, from the several sections of the act of 1899 to regulate the practice of medicine in the State of Illinois, that the State Board of Health is authorized to divide those who desire to practise medicine in this State into two classes; that is, those who desire to practise medicine and surgery in all their branches, and those who desire to practise any other system or science of treating human ailments without the use of medicine or instruments. In this case, the party said that his treatment was a mental science. But he said, too, "I first make a diagnosis. Then I remove the cause for that condition by working and freeing the nerve force.

"I get as near the muscles as I can. If a person is fleshy, it takes more force." He also flexed, or, as one witness said, bent the limbs. The Court declares that it is at a loss to perceive how it could be said that his own testimony did not tend to show that he did treat and operate on patients for physical ailments, within the meaning of Section 7 of the act, which defines who shall be regarded as practising physicians, within the meaning of the act, as including both classes above mentioned, and defines the practice of medicine as including all "who shall treat or profess to treat, operate on or prescribe for any physical ailment or any physical injury or deformity of another." In short, the Court thinks that all the testimony tended to show that he practised what is known as osteopathy, at least, the treatment was of that nature. It says further that it hardly thinks that the large school of osteopaths and those who believe in their method and system of treatment, would be willing to concede that such treatment is no more than that which a trained nurse might administer. While it may be truthfully said that it is not the practice of medicine in the common acceptation of that term, it can not be claimed that it does not "profess to treat, operate on or prescribe for any physical ailment or any physical injury to or deformity of another," and certainly it cannot be insisted that such persons do not practise another "system or science of treating human ailments without the use of medicine internally or externally." Nor is the Court able to see how, under his own evidence, the position advanced could be maintained that he was exempt from the operation of the statute by the last clause of the proviso to Section 7; that is, that he was a person "who ministers to or treats the sick or suffering by mental or spiritual means, without the use of any drug or material remedy." Very clearly this provision, the Court says, means that those who pretend to relieve the ailments of others by mental or spiritual means shall not be considered within the act; but if this party, under the proof in this case, could bring himself within that exception, then every one who treats diseases without administering medicine, either externally or internally, could also be brought within the exception. Few, perhaps, if any, physicians attempt to treat the sick and suffering without appealing to the mental faculties, to a greater or less degree, in aid of the remedies they apply or prescribe; but that it not treating the sick by mental or spiritual means. Again, the Court says, that merely giving massage treatment or bathing a patient is very

different from advertising one's business or calling to be that of a doctor or physician, and, as such, administering osteopathic treatment. The one properly falls within the profession of a trained nurse, while the other does not.

Western Ophthalmologic and Oto-Laryngologic Association.—The seventh annual meeting of this Association was held in this city April 10th, 11th and 12th, under the presidency of Dr. Christian R. Holmes, of Cincinnati, Ohio. Several interesting papers were read and freely discussed.

Health Department Weekly Bulletin.—The weekly bulletin for the week ending April 13, 1902, is as follows: As compared with the week previous there was an increased mortality from all the chief causes of death except scarlet fever, pneumonia and violence. The total 562 deaths reported to the Health Department represent an annual rate of 16.10 per thousand of population as against 14.19 and 13.18 respectively for the previous week and the corresponding week of 1901, or more than one-seventh and more than one-fifth increase respectively. All the air-borne diseases are again as rife as before the March rains, and the high winds and dry surfaces give little present hope of relief. Street sprinkling by the traction companies is not obligatory under the ordinance until May 1st, but, as has been urged before by the Department, it should be begun every year as soon after March 1st as the temperature will permit. Householders who pay for hose privileges or who employ the private sprinklers could do much for the public health, as well as for their own individual comfort by utilizing the public water supply for this purpose to the limit. The City Hall janitor has set an example in this respect which should be generally followed throughout the city. Of the sixteen new cases of smallpox discovered and removed to the Isolation Hospital last week one was imported from Iowa and one from Springfield, Ill.; five others were cases contracted from exposure to the man Speller at the Zion College, discovered March 26th. At the close of the week 42 cases remained under treatment in the hospital, 10 had been discharged, recovered, and no death had occurred. Since January 1st there have been 128 cases treated with one death and 84 recoveries. As illustrative of the unusual prevalence and fatality of the contagious diseases, 10 deaths from puerperal fever are noted—the greatest number in any one week since weekly records were begun. Scarlet fever still prevails as an epidemic and the effect of the water pollution following the March rains is reflected in the increase of typhoid-fever deaths.

CANADA.

Extension to Hotel Dieu Hospital, Montreal.—The Sisters in charge of the above hospital have definitely decided to erect a new wing to the hospital. This will consist principally of private wards, as there has been a growing demand for these during the past year. In addition there will be a new operating-room and two special rooms for the use of the X-ray. The additions will afford increased facilities for the medical students of Laval University. The question of another wing for contagious diseases as advised by Archbishop Bruchesi is under consideration.

Increase of Insanity in Montreal.—To the number of two a day the Mayor of Montreal has been committing persons to the insane asylums. This is a startling statement coming from so prominent an official of the Canadian metropolis. Is insanity really increasing in Montreal, he inquires, or do outside people send in to friends in the city those so afflicted in order that they may receive the charity of the city? As all sent to the asylums on a city order have to be supported by the corporation, the matter is important enough in the eyes

of Mayor Cochrane to demand a searching enquiry at the hands of the City Council.

Phi Delta Theta at McGill University.—The Quebec Alpha Chapter, the first branch of this strong Greek Letter Society to be formed outside the United States, has recently been organized at the celebrated Canadian University. A member of the Fraternity who was formerly a student at Colby College, Maine, but is now a medical student at McGill, Mr. Charles A. Richardson, took a prominent part in the establishment of this chapter. As the Fraternity is extremely conservative on the subject of extension, McGill may consider itself honored.

The Right of a City to Send Smallpox Patients to a Hospital.—This important question is to be reported on by the legal department of Montreal shortly. Some months ago when smallpox was gaining a firm foothold in Montreal, two or three suffering from the disease refused to go to hospital, one even going so far as to threaten to split open the head of any doctor or health official who would come to remove him. The Hygienic Committee of Montreal have taken the subject in hand and have asked the city attorney to report on the right of the city to compel patients suffering from infectious diseases to go to the Civic Hospital.

Canada and the Rhodes' Scholarships.—A special cable to the "Montreal Star" says: "The Rhodes' Scholarships are of a yearly value of three hundred pounds each, and are tenable at any College in the University of Oxford for three consecutive academical years. There are sixty colonial scholarships of which three go to Quebec, three to Ontario and three to Newfoundland. It is likely that the other Provinces of Canada will later on be placed on a similar footing to Quebec and Ontario.

Queen's University, Kingston.—The closing exercises of the Medical Department of this University were held on the afternoon of April 9th. A report of the work of the past winter session was submitted by Dr. Herald, the Secretary of the Medical Faculty, which showed that there had been in attendance in that department 177 students, the largest in the history of the college. Queen's is generally looked upon as a Presbyterian institution, but the medical students seem to be pretty well divided up in their religious opinions. There were fifty-nine Presbyterians; 53 Methodists; 30 Roman Catholics; 26 Anglicans, and the remainder of various denominations. During the coming summer it is the intention of the medical faculty to spend \$6,000 in equipment.

Ontario Board of Health: Quarterly Meeting.—The regular quarterly meeting of the Ontario Board of Health was held last week in Toronto. Dr. Bryce, the Secretary, made an extensive report on the smallpox outbreak. During the past month it is pleasing to learn that the number of cases has diminished by over fifty per cent. Last year 1,879 cases occurred throughout the Province. During January of the present year 629 cases were reported. In February there were 707 cases, while in March it had dropped to 302. The total number reported to the Board of Health in the past fifteen months amounted to 3,517. The general health of the Province for the first three months of 1902 has been most satisfactory to the people. Dr. Bryce also made an extensive report on the mortality returns. In his opinion too often the death certificate was marked "heart failure." He considered that sometimes this return was fraudulent and at other times simply made as a cloak for ignorance. Upon the whole question of mortality statistics an exceedingly interesting discussion sprang up which extended itself so as to involve the duties and responsibilities of coroners. In Ontario there are over five hundred coroners. These are gov-

ernment appointments; and there are altogether too many of them. The law requires them to swear that there are no evidences of foul play before they actually make their investigation. In the opinion of the Board of Health this law should be amended: and it may be stated in the opinion of a good many Ontarians the whole question of the appointments of these officers could be reviewed and revised with profit. For instance, in Toronto there are a score or two of coroners, when one might easily do all the work, providing he receive an adequate salary for his trouble.

Dr. Roddick's Bill for Dominion Registration.—Dr. Roddick's bill for the establishment of a Dominion Medical Council seems to be making friends for itself in the Dominion House of Commons. When it received its second reading, Sir Wilfrid Laurier, the Premier, looked at it rather askance, and doubted its constitutionality. However, since it has been reported on favorably by a special committee of the House, Sir Wilfrid, seems to have looked more closely into the merits of the Bill, and now states that he does not believe that it interferes with provincial autonomy. It is further understood that the Minister of Justice is preparing an elaborate report to present to the House at an early date; and it is thus likely that the small opposition which has emanated from some local Quebec Universities will be overcome, and they will become convinced of the propriety and advantages of the measure. As Dr. Roddick states, the bill is only permissive, as it does not take away any of the existing rights of the Provinces, nor does it yet compel any of the Provinces to take part in the formation of a Dominion Medical Council, if they deem it to their better advantage to remain as they are. Before the measure becomes absolute throughout Canada, each of the provincial legislatures must enact legislation ratifying it.

GENERAL.

Dr. Kinyoun's New Position.—Joseph J. Kinyoun, M.D., Ph.D., late Surgeon of the Marine Hospital Service and Director of the Hygienic Laboratory at Washington, has assumed the directorship of the biological laboratories of the H. K. Mulford Company at Glenolden, Pa. During Dr. Kinyoun's service with the Government he enjoyed special advantages in the study of bacteriology and allied subjects, having been sent to Berlin and Paris on several occasions, where he received special instruction under Professors Koch, Behring, Pasteur and Roux, in the Hygienic Institute, in the Institute for Infectious Diseases of Berlin and in the Institute of Pasteur of Paris. In addition thereto he has on numerous occasions been delegated by the government to international congresses and to visit the various bacteriological institutes of Europe and Japan for the purpose of acquainting himself with the progress made in serum organotherapy and the investigation of infectious diseases. Dr. Kinyoun is widely and favorably known at home and abroad as a sanitarian and investigator and is uniquely fitted for the task of conducting original research work.

Fourteenth International Medical Congress.—This will be held in Madrid, Spain, from April 23 to 30, 1903. Dr. Abraham Jacobi having been requested by the officers of the Congress to form the American Committee, has arranged that the plan devised by Dr. William Osler, which worked so well in preparation for the Thirteenth Congress, shall be followed also for the Fourteenth. Invitations to accept places on the Committee have therefore been sent to the president of the American Congress of Physicians and Surgeons, the president of the American Medical Association, the presidents of the fourteen constituent societies and associations of the American Congress, the Surgeons-General of the

Army, of the Navy, and of the Marine Hospital Service, the President of the Canadian Medical Association and the President of the National Dental Association. Acceptances have been received from nearly all of those invited. Dr. Howard A. Kelly of Johns Hopkins University will deliver the address at one of the general meetings of the Congress, and has chosen for his subject "The Passing of a Specialty." Dr. Ramon Guitéras has been appointed delegate to the Congress by the New York Academy of Medicine. The Committee to date consists of W. W. Keen, M.D., of Philadelphia, President of the American Congress of Physicians and Surgeons; John C. Wyeth, M.D., of New York, President of the American Medical Association; R. H. Chittenden, M.D., of New Haven, President of the American Physiological Society; Walter S. Christopher, M.D., of Chicago, President of the American Pediatric Society; Joseph Collins, M.D., of New York, President of the American Neurological Association; John W. Farlow, M.D., of Boston, President of the American Laryngological Association; Samuel A. Fisk, M.D., of Denver, President of the American Climatological Association; S. C. Gordon, M.D., of Portland, Me., President of the American Gynecological Society; George T. Jackson, M.D., of New York, President of the American Dermatological Association; Horace G. Miller, M.D., of Providence, President of the American Otolological Society; Presley M. Rixey, M.D., of Washington, Surgeon-General of the Navy; F. J. Shepherd, M.D., of Montreal, President of the Canadian Medical Association; George M. Sternberg, M.D., of Washington, Surgeon-General of the Army; O. F. Wadsworth, M.D., of Boston, President of the American Ophthalmological Society; DeForest Willard, M.D., of Philadelphia, President of the American Surgical Association; H. August Wilson, M.D., of Philadelphia, President of the American Orthopedic Association; James C. Wilson, M.D., of Philadelphia, President of the Association of American Physicians; Walter Wyman, M.D., of Washington, Surgeon-General of the Marine Hospital Service; Abraham Jacobi, M.D., of New York, Chairman.

Illegal Practice.—A fine has been imposed by the Chamber of Correction, Paris, upon a druggist who diagnosed and treated a case from an examination of a specimen of urine.

Second International Conference for the Prophylaxis of Syphilis and Venereal Disease.—This will be held in Brussels September 1-6, 1902.

Physician to the Shah.—Dr. Elezarian Randolph, who formerly practised in New York, has been appointed personal physician to the Shah of Persia.

Leprosy in Hawaii.—Five years ago, there were 300 lepers in Molokai; at present there are but 900. **Loeffler's Theory Refuted.**—What is at least a partial refutation of Loeffler's theory as to the incompatibility of cancer and malaria comes in the form of a letter from Dr. R. Plessi of Santa Vittoria di Gualtieri, to Prof. Maragliano, in which he states that malaria is prevalent to such an extent in this town of 2,500 inhabitants that there are at least 300 cases of the disease annually. Yet in five years, 11 cases of carcinoma were observed, 3 of whom were undoubtedly affected with malaria; and in one case, the cancer grew rapidly worse during the malarial attack.

Second International Congress for Electrotherapy and Radiography.—This will be held in Berne, Sept. 1-6, 1902.

Divorce and Suicide.—M. Morselli has collected statistics showing that of one million inhabitants of Prussia, there have been 348 cases of suicide among divorced or separated women, as against 51 among married women. The proportion is even greater among

men; as for 268 suicides of married men, there were 2,834 in those who were divorced or separated.

American Congress of Tuberculosis.—This congress will hold its third annual meeting May 14, 15 and 16, 1902, at the Hotel Majestic, New York, in joint session with the Medico-Legal Society.

Prize Offered by Cuban League against Tuberculosis.—This prize is offered for the best thesis on the Prophylaxis of Tuberculosis in Cuba, under the following conditions: (1) The prize shall be \$150 in American money. (2) The thesis shall not cover more than fifteen pages and must be sent in by October 1st. (3) The theses are to be sent to the President of the League against Tuberculosis, Monserrate, 2, Havana, and are to be signed with a motto; the author's name to be enclosed in a sealed envelope bearing the same motto. The prize is open to all who desire to compete, whether resident of Cuba or not. The theses may be written in any language. The prize will be awarded October 10th, 1902.

French Congress of Alienists.—The next meeting of the Congress of Alienists and Neurologists of France and of French-speaking countries will be held at Grenoble, August 1-8, 1902.

St. Louis Medical Society of Missouri.—The following program was presented Saturday evening, April 12th, 1902: "Cesarean Section—Report of a Case, with Presentation of Mother and Child," by Dr. C. M. Nicholson; "Acute Fatty Degeneration of the Kidney and Liver after Chloroform," by Dr. A. E. Taussig. The program for next week is as follows: "A Clinical Study of Amebic Dysentery, with a Report of Ten Cases," by Dr. H. L. Nieter; "Endemic Amebic Dysentery," by Dr. Jesse S. Meyer; "The Pathologic Findings in Amebic Dysentery," by Dr. Carl Fisch.

American Therapeutic Society.—The following is the program of the third annual meeting of the American Therapeutic Society, to be held at the New York Academy of Medicine, May 13th, 14th and 15th, 1902. Morning Session, First Day, Business Meeting: "Review of the Progress of Therapeutics of the Preceding Twelve Months. Presidential Address," by Reynold Webb Wilcox, New York. Afternoon Session, First Day: Symposium on Valvular Diseases of the Heart: (1) "Etiology and Symptomatology," by Thomas E. Satterthwaite, New York; (2) "Treatment," by George B. Fowler, New York; (3) "Prognosis," by Leonard Weber, New York; "The Capillary Area," by Eli H. Long, Buffalo, N. Y.; "The Proper Introduction of Therapeutic Agents to Science and Commerce," by F. E. Stewart, East Orange, N. J.; "Therapeutics of Chromium Sulphate (Green Chromic Sulphate)," by Louis Kolipinski, Washington, D. C. Morning Session, Second Day: Symposium on Treatment of Pulmonary Tuberculosis: (1) "Climatic," by Josiah N. Hall, Denver, Col.; George Edward Tyler, Denver, Col.; (2) "Medical," by Jesse Shoup, Washington, D. C.; (3) "Dietetic," by William Henry Porter, New York; D. Olin Leech, Washington, D. C.; (4) "Physical," J. W. Chappell, Washington, D. C., and Egbert LeFevre, New York. "A Contribution to the Therapeutics of Iron and Silver," by Albert C. Barnes, Philadelphia, Pa.; "The Causes, Prevention and Treatment of Puerperal Eclampsia," by Robert Reyburn, Washington, D. C. Afternoon Session, Second Day. Recent Advance in Special Therapeutics: "Ophthalmology," by D. B. St. John Roosa, New York; "Gynecology," by Matthew D. Mann, Buffalo, N. Y.; "Surgery," by William H. Carmalt, New Haven, Conn.; "Obstetrics," by Charles Jewett, Brooklyn, N. Y.; "Laryngology," by Charles H. Knight, New York; "Orthopedics," by Newton M. Shaffer, New York; "Genito-Urinary," by Eugene Fuller, New York; "Electro-Therapeutics," by William

J. Morton, New York; "Pediatrics," by Charles G. Kerley, New York; "Dermatology," by Charles W. Allen, New York; "Neurology," by Edward D. Fisher, New York. Morning Session, Third Day: "Changes Occurring in Chemical Substances in the Organism," by J. W. Wainwright, New York; "The Therapeutic Use of the Organic Extracts," by Oliver T. Osborne, New Haven, Conn.; "The Treatment of Gonococcal Arthritis," by DeForest Willard, Philadelphia, Pa.; "The Treatment of Opium Addiction," by Smith Ely Jelliffe, New York; "Some Points on Roentgen Therapy," Carl Beck, New York.

Profs. James and Schurman Honored.—At the recent graduation ceremony at the University of Edinburgh, the honorary degree of doctor of laws was conferred on Prof. William James of Harvard and Prof. Jacob Gould Schurman, President of Cornell University. In bestowing the degrees the Dean of the university referred in the most cordial terms to Professor Schurman's reputation as a deep thinker, and spoke of his zeal and genius for organization, by which a School of Philosophy had been built up at Cornell, such as few universities possess. The Dean also spoke of the foremost place among psychologists won by Professor James.

Bubonic Plague in Rats.—The efforts of the Philippines Commission to reduce the number of rats in Manila are meeting with much success. In a report on the subject forwarded to the War Department by the commission, Major L. M. Maus, Surgeon, U. S. A., and Commissioner of Public Health in Manila, says that between September, 1901, and February 1, 1902, 33,772 rats have been caught by the official rat-catchers and natives. Of this number, 30,786 were examined for infection at the health board's laboratory. Two hundred and twenty-nine bubonic-plague rats were found, or seven-tenths of one per cent. of the number examined. In January, 16,776 rats were examined, and of these, fifty-one were found to be infected, three-tenths of one per cent. for the month, "from which it would appear," says Major Maus, "that the disease among rats is gradually disappearing. Should the plague entirely disappear from the rodents there would be a strong probability of the termination of the present epidemic." No plague cases were reported in January. The last case was reported December 24, 1901. Eighteen cases occurred in Manila in January, 1900, and four in January, 1901. In 1900 the disease was most prevalent in March, when 64 cases occurred, while in 1901 the climax was reached in May, with 124 cases. Every house in which infected rats were found was remodeled, cleaned and disinfected.

Re-election of Sir William Church.—Sir William Church has been reelected to the position of President of the Royal College of Physicians in England. He now holds the office for the fourth year in succession.

Officers of the American Ophthalmologic and Oto-laryngologic Association.—President, Dr. Wm. L. Ballenger, Chicago; First Vice-President, Dr. J. O. Stillson, Indianapolis, Ind.; Second Vice-President, Dr. J. M. Ray, Louisville, Ky.; Third Vice-President, Dr. Edwin Pynchon, Chicago; Secretary, Dr. D. T. Vail, Cincinnati, Ohio; Treasurer, Dr. O. J. Stein, Chicago. Place of meeting, Indianapolis, Ind.

An Appropriate Memorial.—We have just received a very well gotten up memorial to Drs. J. T. Eskridge and Clayton Parkhill, both of Denver. The members of the Denver and Arapahoe Medical Society deserve much credit for the thought and taste displayed in this pleasing tribute to the memory of two of their members. The custom here followed is a good one and is deserving of wide imitation.

OUR BERLIN LETTER.

BERLIN, April 7, 1902.

CONGRESS OF GERMAN SURGEONS—HONORARY MEMBERS—ASEPSIS IN MILITARY SURGERY—PISTOL-WOUND OF HEART—TREATMENT OF FRACTURES—PARAFFIN IN DEFORMITIES—CANCER—APPENDICITIS—GENITO-URINARY SURGERY.

The Thirty-first Congress of German Surgeons was held at Berlin, April 2-5, 1902. The president, Professor Kocher of Bern, opened the Congress with suitable remarks, welcoming the members and congratulating them on the tenth anniversary of their own home, the Langenbeck House.

Bergmann and Koenig of Berlin, Guyon of Paris, Durante of Rome, Keen of Philadelphia and MacEwen of Glasgow were proposed for honorary membership.

The first scientific subject for discussion was the first bandage on the battlefield and the prevention of sepsis thereby. Wounds should not be touched by the fingers and the most strict asepsis should be observed. Prof. Bruns proposed the closing of such wounds with an aseptic paste and adhesive plaster strips instead of with soft bandages.

Prof. Trendelenburg (Leipsic) presented a patient who received a pistol-shot wound of small caliber in the region of the heart; the wound healed spontaneously, but caused subsequently some heart trouble. By the use of the Roentgen rays the bullet was located in the right ventricle. It is now encapsulated and the heart's function is normal again.

At the afternoon session the treatment of fractures was discussed. Should fractures be treated by the still prevalent bloodless method, with splints or plaster bandages, or by operative procedure, viz., the uniting of the bone with silver sutures screwed together?

Noelker (Heidelberg) favors union by wire, if the fracture be not near a joint and if only one bone is to be united or if the fractured parts show such dislocation that by bandaging a poor result must be expected.

Dr. Arbuthnot Lane of London, who by reason of his extensive experience with sutured fractures had been especially invited to take part in the discussion, reported that he had treated 150 fractures united by wire sutures. He favored this method, but it could not be employed in all cases, as the healing process was very slow, and in cases in which by reason of the occupation the patient had to use the limb soon the bandage treatment was preferable.

Schlange, Körte and Heule warned against the abandonment of the old and tried bandage method and Kocher pleaded for individualization of the cases. He is rather inclined to favor wire sutures in joint fractures, so as to obtain a perfectly straight limb.

With a few remarks by Koenig (Berlin) on how to prepare amputation stumps in order to give the patient a chance for proper support and some by Sultan (Koenigsberg) on how successfully to heal dead bone, the afternoon session of the first day closed.

At the evening session demonstrations were made with the projection apparatus, showing the difference of the patella in man and in animals and also the changes which the strangulation produces in the feet of Chinese women, a method customary in that country.

Dr. Stein (Berlin) showed pictures of subcutaneous injections of paraffin for the purpose of correcting the saddle-nose (*nez de mouton*) deformity. Finally Doyen (Paris) gave a kinematographic representation of the operation performed on the Hindu xiphopages, Radica and Doodica, one of whom has recently succumbed to tuberculosis.

The session of the following day, April 3d, was probably the most interesting, the subject being the different

aspects of cancer. The first point at issue was: How is the recidive of a malignant neoplasm to be explained after radical removal of the original growth? Different reasons are mentioned. A part of the tumor might have remained or particles of the neoplasm might have been carried to distant parts by the blood or lymph current. Even the possibility of the surgeon carrying particles of the tumor to a new place on his instruments might be considered. However, it must always be borne in mind that an inclination is prevalent for a new tumor to grow up in the immediate neighborhood of the old growth and this second growth might be entirely independent of the original tumor.

The next discussion was devoted to the etiology of cancer with special reference to parasites as etiological factors. Gussenbauer of Vienna, tends in his opinion toward the parasitic theory, but he does not feel in a position to go further into the matter at present. Some others rather peculiarly do not consider the etiology of cancer as the most important momentum, but consider it best thoroughly to examine first into the process how normal tissue elements are propagated. Petersen and Kahlden are among the latter.

Demonstrations of microscopical sections were given and cultures of his parasites were shown by Schüller (Berlin) and Feinberg, the assistant of Leyden, showed some colored slides, purporting to be cancer-producing micro-organisms. Schüller's demonstrations created considerable interest, while Feinberg's claims were rather skeptically received. O. Israel, Virchow's first assistant, fought somewhat shy of the question.

In carcinoma of the stomach and intestines Kroenlein of Zürich pleads for early and radical operation. As soon as the disease is recognized, the operation ought to be performed. This would insure much better results. At the end of the session a case was reported in which the radial distal end had been resected and a phalanx of the big toe had been successfully employed to supply the missing radial section.

The next session dealt with abdominal surgery, especially the operation for appendicitis. Sonnenburg (Berlin), who has performed a large number of operations, found many of these cases accompanied by a pneumonia, which he believes is caused by embolism. The patient is afraid to move about, weakness of the heart results and subsequently the embolism and pneumonia develop. An interesting report was made by Bertelsman of Hamburg, of 100 microbic blood-examinations in order to show the different kinds of microbes and their number during different stages of acute infectious diseases. He does not believe that the presence of microbes even in large numbers indicates any conclusion as to the prognosis of the case, but that their presence is often the means of recognizing the disease.

The sixth session of the Congress was occupied with genito-urinary surgery. The most important question ventilated was: If it be deemed necessary to remove one kidney, how is one to know whether the remaining kidney is capable of supplying the work of both kidneys? In other words, is the remaining kidney sound? To decide this question, the freezing-point of the urine must be determined, the normal urine freezing at 0.56° C. Dr. Loewenhardt recommends an electrical apparatus for the same purpose.

On Saturday, the closing day of the Congress, a collection of cases, representing all branches of surgery was reported. Of special interest was a report of Saenger (Hamburg) of number of cases of inoperable brain tumors, which had caused headaches, loss of vision and other results of intracranial pressure. To alleviate these symptoms an opening into the skull near the seat of the tumor had been made and the result was very satisfactory.

Casuistic remarks by some of the members closed the scientific work of the Congress. During four days 118 different subjects were presented and discussed.

The men proposed for honorary membership were then elected and also the new president, Prof. Kuester of Marburg, who is known through his work on kidney surgery, which appeared in the *Deutsche Chirurgie*. He is an able man and a congenial one and the Congress is to be congratulated upon its choice.

TRANSACTIONS OF FOREIGN SOCIETIES.

GERMAN.

POST-TYPHOID NERVOUS LESIONS—LUMBAR PUNCTURE AND MENINGITIS—DISINFECTION OF THE HANDS WITH ALCOHOL—ABSCESS OF THE BRAIN—ACUTE TROPHONEUROTIC BONE ATROPHY—ABORTION AND ENDOMETRITIS—CHRONIC ATROPHIC GASTRITIS—STONE IN THE BLADDER.

The topics which occupied the attention of the German societies at sessions of recent date were of important clinical significance and practical weight. Selection of the following subjects has been made as representing those most directly applicable to every-day practice.

LENHARTZ, at the Aerztlicher Verein in Hamburg, January 21, 1902, presented a fourteen-year-old-boy, in whom, secondary to a remarkably severe attack of typhoid fever, extensive and acute incoordination appeared affecting all four extremities and the trunk, although neither sensibility, muscular sense nor general strength showed much depreciation. On examination the boy presented the following symptoms: Exaggerated patellar reflexes; ability to stand with wide-spread legs without support, but powerless to take a single step without marked swaying of the whole body and the danger of falling; ability to go considerable distance with support, showing distinct toeing-in and great swaying of the body, constituting together a well-defined ataxia; no disturbance of the bladder or rectum; a very slight decrease in the ordinary functions of intelligence, for example, slow mental arithmetic, when according to rule, but failing when not according to rule; occasionally periods of surprising shrewdness and smart exclamations; various disturbances of speech, chiefly hesitancy, deliberation, monotony and peculiar scanning; failure in writing ability, especially the placing of several letters upon each other, and the irregularities of the shading strokes. As to the question whether in this patient there was severe functional or special anatomical sequelae of his typhoid, the answer lies in the history of his attack. The youth owed his life to the diligent nursing and the careful treatment which he had. For many weeks physicians watched day and night over him, as he lay from August 7th to the end of October with uninterrupted coma which was certainly not any cataleptic state. Through this period and until November 9th, he had to be fed with the stomach-tube. When he came out of the coma by degrees, he was at first totally blind and deaf and feeling was the only sense that connected him with the outer world. Examination of the eye and ear showed them to be practically normal. Hearing returned first. As he began to see again early in November he recognized pictures, letters, words and understood them, but had no comprehension of spoken language. Only through December and January has the ability to utter language returned. The attack of typhoid fever was itself intense. In addition to the unusual, long, deep coma, he had two copious hemorrhages from the bowel during the primary attack and one relapse; double-sided pneumonia in each lower lobe, a very high grade weakness of the heart, bed-sores on the back, buttocks, trochanters, and feet, complicated the picture. Normal salt

solution infusions, free dosage with bismuth during the hemorrhages, the administration of serum, very careful feeding, and stimulation are responsible for the cure. It is probable that the severe cerebral symptoms are referable to very small numerous changes in the brain called forth by the toxicity of the original disease. Whether with the present means of diagnosis it is possible to call these changes anatomical is very doubtful. In 1872 Ebstein described a memorable case in which seven years after a similar intense typhoid attack multiple small pus foci were found in the brain which were analogous to the lesions of multiple sclerosis. It is possible that in this case of Lenhardt a very severe exhaustion of the central nervous system had taken place as a result of the uncommonly intense, acute, infectious disease through which the patient passed, himself the offspring of a family of poor nervous development. The prognosis is probably favorable, with a slowly developing improvement. Methodical practice in speaking and in the use of the limbs with suitable protection against accident will be the best means of treatment. The author feels confident of this outlook because nineteen years ago, while he was assistant in the clinic at Leipsic, he observed and described a case almost photographically the same as this one. The patient ten years later had almost entirely recovered from all his symptoms. In this latter case acute ataxia and aphasia appeared after severe dysentery.

G. KRÖNIG, at the Berliner medicinische Gesellschaft, February 5, 1902, showed a young man who a few weeks before had been treated and cured by him of spinal meningitis, with distinct symptoms. Lumbar puncture under a pressure of 500 millimeters had drawn off purulent fluid which contained Weichselbaum-Jaeger meningococcus. Surprising improvement followed this procedure, which was repeated two days later, bringing away a few drops of very thick pus. For the thinning of this he then injected about 1 cubic centimeter of sterile normal salt solution, which was followed by a stream of pus. The instillation was repeated until in all total 6 cubic centimeters were given. Improvement continued. Two days later the puncture was repeated and a clearer, thinner fluid was withdrawn. Four days after this the spinal fluid appeared to be macroscopically and microscopically normal. Krönig emphasized three points brought up by the course of this case: (1) Was the puncture with instillation necessary? He answered that the resorption of the thick pus without the thinning brought about by the instillation would hardly have been possible and that probably it would have developed into scar tissue or again into a chronic meningitis. (2) The instillations were without danger. (3) They are of service in the purely spinal form, but probably not in the cerebral form of epidemic meningitis.

The opinions offered in the discussion of this practical and important subject were the following: P. Jakob compared this procedure with his own and that of Leiden, for the administration of drugs through lumbar puncture. He considers, however, that it is serviceable not only in spinal but also in cerebral forms of the disease because, according to his experiments, salt solution can very well reach the brain. He has injected as much as 20 cubic centimeters of the fluid and even a very weak solution of carbolic acid. In two or three cases of purulent meningitis good results were obtained. The pus must not only be thinned, but the whole cavity of the arachnoid must be washed out. No danger is caused by it. He considers the necessity of such instillation absolute. A. Fraenkel denied the possibility of a lateral washing out in the face of the anatomical conditions. The pus must be hidden in many small pockets and folds. The value of lumbar puncture lies

in the relief of pressure upon the nervous system, and is available in the serous form also according to Quincke. Epidemic meningitis with pus is not easily cured without such a procedure. He has recently employed it with success four times in the hospital in Urban but did not either instill or wash out. In one of these cured cases the symptoms of trouble in the brain were extraordinarily severe and the pressure reached 1,000 millimeters. Senator thought that in the case of Krönig a thinning of the pus was not brought about so much as a washing-out of the end of the syringe tube.

SCHAFFER, at the Medizinische Gesellschaft in Berlin, February 5, 1902, reported another series of observations as to the use of alcohol in disinfecting the hands, with a conclusion that hot water and alcohol still give the best results. His method is simply a thorough scrubbing of the hands for five minutes with hot water and soft soap, followed by immersion in alcohol of great concentration for three to five minutes.

VON KRYGER, at the Aerztlicher Bezirksverein zu Erlangen, January 28, 1902, demonstrated a specimen of brain abscess in the right frontal lobe. After a gunshot wound in June, 1901, considerable pus developed which appeared to be cured by a trepanation of the frontal bone in August without finding or removing the projectile. Early in January, 1902, a very great relapse in the symptoms occurred, with severe pain in the head, dizziness, and finally a sudden onset of unconsciousness followed rapidly by death. The autopsy showed an abscess the size of a pigeon egg, with thick walls in which was embedded the bullet. This abscess had broken suddenly into the ventricle of the brain. In addition, there was on the base of the brain over the region of the pons a very thick purulent exudate. He also presented a case of abscess of the brain following a purulent otitis media. The young man had suffered for years from a purulent discharge from the right ear and was suddenly attacked with high fever, pain in the back of the head, increased by movement but not by percussion. On the third day motor paralysis of the left lower extremity and paresis of the left arm, with escape of the sensorium occurred. At the operation the petrous bone was exposed after the manner of Bergmann with the evacuation of a teaspoonful of thick, foul-smelling pus from between the dura and the bone; exposure of the bare bone and a perforation of the tegmen tympani; discovery of pus in the other bony recesses of the organ of hearing and in the mastoid process. Puncture of the brain gave no evidence of accumulation of pus elsewhere. After temporary improvement death occurred on the third day after the operation. The features of the autopsy were a copious purulent exudate over the convexity of the brain; on the right side within the right temporal lobe, an abscess-cavity the size of a chestnut with thick walls connecting with the dura and with the hole in the tegmen tympani through a passage about the size of a pea, showing an unmistakable connection between the pus in the ear and that at this situation in the brain, and proving the great difficulty of the diagnosis and the failure of Bergmann's operation to reach this special focus.

SUDECK, at the Aerztlicher Verein in Hamburg, February 4, 1902, read a paper on the acute trophoneurotic bone atrophies secondary to inflammations and injuries of the extremities and their clinical significance. He exhibited a number of X-ray photographs proving that after inflammations, first of all of the joints, then of the soft parts, and also after injuries such as fractures, distortions and contusions of the joints, distinct high-grade atrophy of the bone may occur not only in the bones directly interested in the joints, but sometimes in those at more distant points of the same extremity. These

strophies of bone are distinguished by their peculiar form, irregular fatty degeneration of the bone, especially in the spongy substance, and also through a rapidity of their appearance and the intensity of their degree. Sudeck places this disease of bone in the same category as similar acute degeneration of muscle, and other trophic disturbances (cyanosis, edema of the skin, hypertrichosis, etc.), following injuries of joints. He thinks that all these developments are due to a reflex trophoneurosis and attaches great clinical importance to them. In the hands one observes as the result of this bone atrophy, stiffness of the fingers and tenderness, and in the feet small fixations and great tenderness even at the slightest touch. Bone atrophy, like muscle atrophy, may be very obstinate and extend over many years. These conditions are, according to the author's observation, usually not recognized and are usually ascribed to exaggeration or pretence or to tuberculosis of the bone, or in the case of the feet to inflammatory flatfoot. He thinks that under this same heading belong the conditions which have been described as joint neurosis. The treatment consists in orthopedic management, massage, hot baths, and the circulatory treatment of Helferich. The feet should not be immobilized, but should be relieved from bearing weight. The condition described occurs not only after great injury, but often also after slight injury, as, for example, sprains of the hand or the foot. Atrophy of bone is observable rather frequently, but after all, only exceptionally after these injuries. When it is present, however, it possesses the character of a distinct clinical picture and shows as a rule obstinate symptoms which may appear to have no relation with the injury itself.

FLATAN, at the Nurnberger medizinische Gesellschaft und Poliklinik, January 2, 1902, gave some practical points on the treatment of abortion and its consequent endometritis. Large retained fragments of the placenta or moles he always removes with his fingers, because the curette or the sharp spoon usually slides over firmly adherent masses without removing them, especially if the physician, as experience goes, begins the operation without sufficient dilatation of the os and therefore with too small instruments. Rather small, retained fragments of placenta he thinks are best and most surely removed with Winter's abortion forceps, the right use of which shuts out the possibility of perforating the uterus. Shreds of the decidua, large or small, sticking fast most frequently in the necks of the tubes, are best taken away with the sharp large curette, after the neck of the womb has been widely dilated. Small curettes and pointed forceps are instruments, which in his opinion, are almost useless and should therefore be discarded. The catarrhal endometritis and its most obstinate symptom, leucorrhea, the author has treated with greatest success for many years with formalin. Necessary to the successful management of it is a good self-retaining speculum. None is better than Neugebauer's or the Trelat-Cusco, if the blades be $1\frac{1}{2}$ to 2 centimeters shorter than most of them sold. Strong, firm-biting volvulum forceps are also desirable. For carrying the medicament he uses Menge's hard rubber sound because it is so easily rendered sterile. He uses a 25-50-per-cent. solution of formalin and repeats the treatment every six days. The results are surprisingly flattering.

J. MUELLER, at the Physikalisch-medicinische Gesellschaft zu Wurzburg, January 9, 1902, presented and described a case of chronic sclerosing gastritis. The patient was thirty-nine years old, master baker, previously always well, until 1882, when he became infected with gonorrhea and syphilis and was treated with inunctions and potassium iodide. In 1890, in Ale, ulcers of the tongue appeared which were treated

successfully with antisyphilitic measures. In 1895, at Jena, he was under care for double vision and the inunctions were resumed, but not for long because the eye symptoms soon disappeared. He then remained in good health, especially without indigestion. In the spring of 1899 his first symptoms of gastric trouble appeared with the following features: Under entirely normal appetite he could eat less than previously, was able to take only a very little at a time, because the stomach after large amounts showed signs of pressure and soon relieved itself by vomiting. Finally, on account of his enormous appetite he was compelled to nibbling all day long, in spite of which he lost much weight and strength and had to give up his vocation. Examination showed on the first occasion, in the summer of 1900, the following features: Spasm of the esophagus in the region of the cardia whenever the sound was passed, so that the suggestion was made of a spasm of the esophagus as the foundation of the disease. Later, however, this condition disappeared and the cause of the symptoms was proved to be a distinct decrease in the size of the stomach which contained only from $\frac{1}{4}$ to $\frac{1}{2}$ a liter of water. If more were put in, a feeling of heavy pressure immediately appeared and was soon followed by projectile vomiting. A similar occurrence was seen when the stomach was blown up with air, excepting that under air a tumor appeared in the left side below the ribs. Gastrodiaphany and X-ray illumination proved that the end of the tube was really in the stomach. The secretory function of the mucous membrane of the stomach was almost entirely gone. The differential diagnosis lay between an hour-glass stomach or a carcinoma. The latter was ruled out from the fact that during the past eighteen months the man had undergone considerable improvement. The writer's opinion was that the man suffered from a chronic sclerosing gastritis with atrophy of the mucous membrane and shrinking of the volume of the stomach, such as were recently described by Hemmeter and Stokes. The cause of these cases can be ascribed to syphilis. The treatment the man was undergoing was renewed inunctions, a dosage of iodide of potassium with methodical gradual dilatation of the stomach by means of water. Under this management a distinct improvement had been attained, so that at the present time the patient can cautiously take almost his former amount of food. A detailed report of this case will be given later.

RIFF, on January 25th, at the Unterel-saessischer Aerzteverein, presented a specimen removed at autopsy from an eighty-two-year-old man, consisting of the bladder with a large diverticulum which was filled with stones. For ten years the man had showed symptoms of bladder disease, for two years ammoniacal changes in the urine, for six weeks blood and pus in the urine, a capacity of the bladder two years ago of 100 cubic centimeters, but of only 50 cubic centimeters for the past six weeks. The specimen presented, in addition to the slight hypertrophy of the middle lobe of the prostate, a diffuse diphtheritic inflammation of the bladder and over the right ureter a large diverticulum which contained eight or nine rather heavy stones. On account of the small capacity of the bladder, cystoscopy was impossible. For this reason the diagnosis was made only at autopsy.

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting, Held April 3, 1902.

The President, Robert F. Weir, M.D., in the Chair.

The first business of the evening was the consideration of the resolution presented by Dr. Joseph D. Bryant at the last meeting in March with regard to the Lunacy

Bill which places Ward's Island Asylum under the charge of a single superintendent. These resolutions ask the Governor of the State of New York to appoint at least two superintendents, since the number of patients in these institutions seems to demand this as a precaution. On motion the resolutions were unanimously adopted.

The scientific business of the evening consisted of a **SYMPOSIUM ON THE TREATMENT OF FRACTURES OF THE LOWER END OF THE RADIUS.**

Varieties of Colles' Fracture.—Dr. Carl Beck read a paper on the modern treatment of fractures of the lower end of the radius, as it is dictated by the relations shown in the fractured parts by the Roentgen rays. Dr. Beck said that the most interesting conclusion as well as the most important practical lesson, that can be drawn from careful study of radiographs of fractures of the lower end of the radius is that routine treatment can not and must not be the rule. Each fracture must be treated according to its individual indication. Colles' fracture—that is, a break in the radius about two inches above the distal end of the bone—does not present any uniform type, but differs in almost every case. It is often said that the characteristic symptom of Colles' fracture is the silver-fork deformity. There are not a few cases, however, that must be classed among Colles' fractures in which this deformity does not occur. Volkmann in Germany and Roberts in this country have shown how different the conditions presented by some of these fractures may be. There is need of a new classification and of a consistently individual method of treatment.

Reduction and Immobilization.—Reduction and immobilization remain the most important parts of the treatment of Colles' fracture. There has been for some time a tendency to give too much weight to a false maxim in the treatment of these cases. The soft tissues and the injury to them are erroneously said to be the important elements. As a matter of fact, however, the wounds of the soft tissues heal very rapidly and give very little trouble if the broken bones be properly reduced. When there is no reduction the abnormal pressure causes the soft parts to remain in a state of constant irritation that proves extremely annoying to the patient and delays tissue repair.

Careful Reduction.—Like a break in the continuity of tissue a fracture of bone can be expected to heal only when the parts are properly coapted. No surgeon would look for primary union in a wound of the soft tissues if the edges were not well brought together. The most important practical use of the X-rays is the opportunity they provide for viewing the bones underneath the dressings after they have been applied. This enables the surgeon actually to see whether reduction has been accomplished and whether the dressings are of a kind to maintain this reduction and the immobilization of the fragments that will encourage healing of the fractures. The degree and the form of the deformity that exists after a fracture of the lower end of the radius is the important factor in the prognosis of the case. Reduction is usually easy, but sometimes it can be accomplished only with very great difficulty. The Roentgen radiograph constitutes the best possible evidence of the condition of affairs in the fractured bones and so enables the surgeon to show at any time what the probable prognosis of the case is and consequently to defend himself against any charge of mal-practice.

Treatment of Complicated Fractures.—If there be a fracture of the radius into the joint at the wrist, the arm should be done up in a posterior splint, the hand placed in a sling with the weight resting on the ulnar

border and the patient should be encouraged after two or three days to make movements of the fingers upon his chest, as if he were playing the piano. After a time freer movements of the fingers should be prescribed and the patient should carry marbles and play with them in his fingers. The displacement of the lower fragment is usually on the dorsum, but there may also be lateral displacement. At times this lateral displacement is toward the ulna, though more commonly it is outward. When these lateral displacements have occurred, it may be necessary to have an assistant make proper counter-pressure while extension is being made in order to secure proper reduction. Extension can usually be accomplished best by firmly grasping the patient's hand, as if for a hearty handshake and then using the requisite amount of force.

Splints and Pads.—When the fractures of the lower end of the radius are complicated, splints made of plaster of Paris are the best, and even impacted fractures or the dreaded "Y" fracture may prove perfectly amenable to treatment. In "Y" fractures the inner fragment, which usually has a tendency to be displaced toward the ulna, may be pressed back to the radius by putting a large drainage-tube underneath the splints and gradually sinking it into the interosseous space. Fractures into the joint are always difficult of cure and no guarantee of a good result must ever be given. In these cases particularly radiographs are almost necessary to protect the surgeon himself from foolish or ill-meaning individuals, or from the machinations of lawyers.

Development of Diagnostic Acumen.—The X-rays may well serve of the highest usefulness in teaching the surgeon the minutiae of the clinical diagnosis of these fractures. After careful palpation a sketch should be made that represents the surgeon's idea of the condition of the bone at the point of fracture. This sketch should be compared with the radiograph after it has been taken and the differences noted with the reasons for the failure to recognize any peculiarities that may be present.

After-Treatment.—It is the custom to recommend massage early in cases of fractures of the radius. There are certain cases in which spiculae of bone are present in which massage almost surely leads to severe pain. In such cases it must not be employed. When the union of the bones is faulty, simple refracture may be accomplished rather easily from two to three weeks after the original dressing. After five weeks, however, an osteotomy must be performed and it may be necessary to remove a wedge-shaped piece of bone by excision.

Common Error in Treatment of Radial Fractures.—Dr. J. B. Roberts of Philadelphia, read a paper in which he stated that in his opinion the most common error in treating these fractures of the lower end of the radius is the failure to secure complete reduction of the fragments. Dr. Roberts has seen many un-reduced fractures and it seems probable that many professors of surgery do not teach and many physicians do not practise the proper method for the reduction of these fractures. In some forms of fracture mere molding of the fragments is sufficient to bring them back to their place. In some cases, even of Colles' fracture, not very much force is needed, if it be used with proper knowledge. In many cases, however, all the muscular force that the surgeon can exert must be employed to secure reduction of the fragments. Fractures of the radius, no matter what their complications, have all to be treated the same way. If the fracture be impacted, correction of the deformity must be secured. If there be coincident fracture of the ulna, this adds very little to the necessity for precautions to be taken, provided the deformity be overcome. The age of the patient even

makes very little difference. As a rule, however, the surgeon needs to set nearly all the force of his two hands at work in order to secure proper replacement. As much force must be exerted as is necessary to break the tibia and fibula of a child for the correction of bow legs.

Means to be Employed.—The fractures of the lower end of the radius produce a deformity that is typical, and the original state of the bone—the concavity of the anterior surface with the flatness of the dorsal surface—must be restored if a good result is to be obtained. It may be necessary to use both hands and the knee in order to secure a reposition of the fragments. Needless to say, in many cases anesthesia will have to be employed or the patient will not permit the exertion of the force necessary to secure correction. Moreover, physicians are often too timid and too easily discouraged by the complaints of their patients if an anesthetic be not employed. The setting of the fracture may be undertaken without an anesthetic if the doctor be conscious that he is able to exert all his force at once without hesitation and if the patient be of the kind who will stand severe but brief pain, which will be over before he realizes its intensity. Quickness and assurance alone can make up for the deliberation that can be employed when the patient is narcotized. Compassion and timidity in these cases is always mistaken kindness.

Use of an Anesthetic.—As a rule, a general anesthetic must be employed if the fracture be somewhat old, say two and a half to three weeks, or if the patient be very sensitive. There are many physicians, however, who have not the heart to inflict the pain necessary for the reposition of the fragments without an anesthetic. In certain cases, even in reasonably insensitive patients the difficulty of reducing the fragments will be so great that an anesthetic will be necessary. Probably the more generally an anesthetic is employed, the less do bad results occur unless the surgeon be very confident of his own manipulation.

After-Treatment.—Very little after-treatment is required in most cases if the reduction of the deformity be complete originally. It is quite sufficient, as a rule, for the patient to carry the hand in a sling, but most patients are reckless, some of them are careless, and not infrequently these fractures occur in young persons who can not be depended on to give the injured member rest. The use of a splint, therefore, is generally required. A posterior splint coming down as far as the end of the metacarpal bones is usually the most useful. A firm wristlet of adhesive plaster made thick by employing a number of layers will often be a sufficient protection for simpler cases if there be no marked tendency to recurrence of the deformity.

Secret of Success.—The secret of success in treating fractures of the lower end of the radius is to restore effectively the shape of the bone, no matter what the complaints of the patient may be. If this be always done, the bad results so often seen will not occur. Surgeons who make it a rule not to compound between their feelings and their surgical sense in this matter and insist on thorough correction do not fear, but welcome these patients.

Simple After-Treatment.—Dr. Robert F. Wheeler, opening the discussion, said that fractures of the lower end of the radius are of constant interest, because of their frequency. He had been especially interested in finding that so much insistence was placed upon proper correction of the deformity. His own first memory in a medical way of fractures of the lower end of the radius was the case of his professor in surgery, Dr. Willard Parker. Dr. Parker suffered a fracture of the lower end of the radius, and after about forty-eight hours re-

sumed his teaching with his arm done up in a sling and protected only by the simple sticking plaster that was then in use. This incident made a lasting impression upon the students and showed them the necessity not for apparatus, but for primary correction of the deformity.

Vanderbilt Clinic Experience.—Dr. Edward M. Foote said that at the Vanderbilt Clinic there were ten surgical assistants, each of whom assumed the responsibility for cases under his own care. There seemed to be a certain agreement, however, with regard to fundamental points in the treatment of fractures of the lower end of the radius. With regard to an anesthetic, most of them are of the opinion that this is unnecessary, except in very difficult cases or in extremely sensitive patients. One or two of them, however, are of the opinion that the use of an anesthetic always allows so much better correction that it seems advisable to employ it. Dr. Foote himself is of the opinion that an anesthetic should be employed in every case of Colles' fracture. There is really no waste of time, the patient is saved what is unnecessary pain, the surgeon is able to secure absolute correction of the deformity and to assure himself of this correction and of any complications that may exist. Nitrous oxide is sufficient as an anesthetic for these cases and its employment will do more than anything else to prevent incomplete reposition and the pain that patients so often have to bear for several days as a result of failure of proper correction.

The X-rays in Colles' Fractures.—Dr. Foote does not think that the X-rays should necessarily be employed in every case of fracture of the lower end of the radius. To be of service at least four radiographs should be taken, and, as this would cost from twenty-five to forty dollars, it does not seem that patients should be asked to pay so much when the clinical symptoms are so plain as to make the diagnosis clear without this means. The radiographs must be taken in two planes, so that no distortion may be missed. This overcomes one objection to the use of the X-rays—their supposed liability to error. Another objection has been made, namely, they will set too high a standard in the treatment of these cases. Dr. Foote is of the opinion, however, that this will only lead to more open operations for the treatment of complicated fractures at the wrist and this will prove a real surgical gain in the end.

Splints Advised.—The surgeons in the service at the Vanderbilt Clinic are not agreed as to the splints that should be employed. In most cases there is no tendency to deformity after correction is once assured. In these cases no splint or at most a very small posterior splint need be employed. Whenever the deformity has a tendency to recur a molded plaster-of-Paris splint should be employed and put on under anesthesia. The use of the X-rays will undoubtedly tend to improve clinical diagnosis rather than lead to its neglect if comparisons be made between the results of the clinical diagnosis and the X-ray picture. The use of the X-rays gives an assurance of the proper position of the fragments if the picture be taken when the splints are fully applied.

Hudson Street Hospital.—Dr. F. L. Taylor said that at the Hudson Street Hospital an anterior and posterior molded plaster splint is invariably used. Great care is taken to reduce completely the deformity. For this purpose manipulations rather than force are employed. Impaction or embedding of the fragments in the soft tissues hinders flexion and manipulation often enabled surgeons to correct the deformity when mere force would not. A thick layer of vaselin is always applied before the plastered splints are applied to the hand. This form of dressing allows the arm to

be passed through a coat-sleeve—a not unimportant consideration in such cases. In this way people may go about their business and are rather encouraged to wear the splint for the proper length of time. The use of these splints enables the surgeon to employ massage whenever this is deemed necessary. They should be worn for at least two weeks and usually for from three to five weeks. When necessary to secure correction of the deformity, pads are employed beneath the splint.

New York Hospital.—Dr. B. T. Tilton said that not enough stress has been put upon the frequent necessity of the employment of an anesthetic in order to secure proper reduction of the deformity in most fractures at the lower end of the radius. When these fractures are quite recent, that is to say, when not more than an hour or two has elapsed since their occurrence and when the soft parts have not been much injured, the setting of the fracture without an anesthetic is often quite easy. As a rule, however, when these fractures come to the hospital they are many hours old and sometimes from forty-eight hours to a week has elapsed since their occurrence. It is impossible at this time to secure reposition of the fragment without an anesthetic. Dr. Tilton employs an anesthetic more and more for all fractures of the lower end of the radius and is quite encouraged in the practice. The displacement of the fragments always increases with the lapse of time and an anesthetic is absolutely needed in order to relax the spasmodic conditions in the soft parts after the fracture is a day old.

Splints.—Wooden splints are employed, an anterior and a posterior. These are padded in three places. One of these pads is placed over the dorsum in order to keep the lower fragment in place. A second is put on the anterior splint for counterpressure over the upper fragment. The third pad is placed on the ulnar side, to crowd the ulna toward the radius and prevent the bony diastasis which often results in these cases and forms an unsightly result. When there is much displacement a moulded splint that can be easily removed and allows of massage and passive movements early in the case is employed.

Necessity for After-Treatment.—After-treatment is essential in all cases of fracture of the lower end of the radius and the complaint of bad results is due more to neglect of the after-treatment than to any fault in the primary treatment. The functions of the tendons and the joints must be obtained. There may be good union and bad function, or bad union with good function. A somewhat unsightly looking wrist, that permits, however, of the proper use of the fingers and the hand, is much better than a shapely joint with loss of function. Very early in the case the patient must be directed to use the fingers and make various movements. After two weeks the patients should be advised to use the wrist and the splints should be shortened so as to permit some motion in this joint. If the fingers be kept straight they will be stiff. This is not so apt to occur if they be kept in a bent position. It is important to remember that in all cases of fracture, the soft parts are also injured and they must be carefully treated. In patients who are over forty a bad result will almost surely occur, if the greatest care be not taken to secure functional movement.

Roosevelt Hospital.—Dr. W. C. Clark said that at the Roosevelt Hospital an anesthetic is employed if the fracture be impacted or present special difficulties. As a rule, however, reduction is done without gas. Moulded plaster splints are employed as they present less points at which pressure may be exerted and so are much more comfortable. The splints should come at first only as far as the middle of the fingers. After

about ten days it should not come beyond the base of the fingers and then should be gradually shortened so as to encourage movements. If the patient be over thirty, hyperextension of the wrist must be secured with flexion of the fingers so as to relax the extensor tendons. After three weeks of treatment passive movements should be encouraged in the wrist joint itself, especially as regards the exercise of rotation and supination. If the diagnosis be unsatisfactory, or if the case be very complex the X-rays are employed. It would be too time-taking, however, to employ them in practically all cases.

Results at Roosevelt Hospital.—Dr. J. P. Fiske said that out of 1,029 fractures treated in five years at Roosevelt Hospital, there were 172 fractures of the radius, 142 of these being of the variety known as Colles' fracture; 14 per cent., therefore, of all the fractures treated—that is, something more than 1 in 7—were of this type. The more general use of the X-rays has not changed the treatment of this class of fractures, though undoubtedly in recent years better results have been obtained than formerly. This is due to the fact that surgeons recognize more generally the necessity for care in these cases and massage and passive movements are employed more generally. Whenever there is doubt the X-rays are employed. If the reposition of the fragments cannot be accomplished easily an anesthetic is employed. In patients over forty years of age the hot-air box is used toward the end of the treatment in order to favor that relaxation of the tissues which secures recovery of function. Dry heat at 350° F. is absolutely the best agent for this. This has been shown by long experience at Roosevelt Hospital. The forcible wrenching that is sometimes employed in order to overcome the stiffness of joints and muscles, really only aggravates the condition. Each case must be treated according to the individual indications and especial care must be taken to adapt the treatment to whatever injuries of the soft parts may exist. The dressing should never be applied at first to be left on for any length of time, but should be reapplied as the edema subsides.

Shortening of Radius.—Dr. George R. Fowler of Brooklyn said that the diagnosis of obscure conditions about the wrist-joint after severe injury has been greatly aided by the X-rays. The differentiation of contusion, sprain and fracture, is often an extremely difficult question. One of the important clinical signs on which sufficient stress has not been laid is the shortening of the radius that is readily found to exist if careful measurement of both arms be made. In impacted fracture, in which the X-rays may prove of little service, the shortening of the radius and the comparative lengthening of the ulna are pathognomonic signs. Sometimes these fractures heal very satisfactorily and yet function is very imperfect. Dr. Fowler saw a case recently in which the comparatively lengthened ulna acted as a lock to the wrist-joint. The lowest part of the ulna was removed by open operation and then function was much better.

Old Methods of Treatment.—Dr. Stephen Smith said that Colles, who originally described the particular fracture of the lower end of the radius that occurs most frequently, had seen very many of these fractures and claimed to have obtained excellent results with perfect use of the joint and the hand afterward. The main feature of Dr. Colles' treatment was the employment of a transverse pad across the dorsal prominence with a tin splint around the limb. Dr. Weir's memory of Dr. Parker's injury may be revised to the extent that Dr. Parker used to present his own arm as an example of the fact that even with the best possible surgical care deformity might persist after Colles' fracture.